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REPORTS

FROM

COMMISSIONERS:

SEVENTEEN VOLUMES.

—(8.)—

ALKALI ACT (1863); CHILDREN'S EMPLOYMENT; FACTORIES; MINES.

Session

7 February —— *6 July* 1865.

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REPORTS FROM COMMISSIONERS:

1865.

SEVENTEEN VOLUMES:—CONTENTS OF THE

EIGHTH VOLUME.

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ALKALI ACT, 1863.

FIRST ANNUAL REPORT

BY

THE INSPECTOR

OF HIS

PROCEEDINGS DURING THE YEAR 1864.

(*Presented to both Houses of Parliament pursuant to Act*
26 *&* 27 *Vict. Cap.* 124.)

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
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FOR HER MAJESTY'S STATIONERY OFFICE.
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ALKALI ACT, 1863.

FIRST ANNUAL REPORT

BY

THE INSPECTOR

OF HIS

PROCEEDINGS DURING THE YEAR 1864.

TO THE LORDS OF THE COMMITTEE OF PRIVY COUNCIL FOR TRADE.

My Lords,

The 12th section of the Alkali Act requires the inspector to make a report in writing to the Board of Trade on or before the 1st of March; I have accordingly the honour to transmit the following:—

The Alkali Act of July 28th, 1863, is "An Act for the more "effectual Condensation of Muriatic Acid Gas in Alkali Works." An alkali work is defined by the Act to be "every work for the "manufacture of alkali, sulphate of soda, or sulphate of potash, "in which muriatic acid is evolved." It is required that "every "alkali work shall be carried on in such a manner as to secure "the condensation to the satisfaction of the inspector, derived "from his own examination or from that of a sub-inspector, of "not less than 95 per centum of the muriatic acid gas evolved "therein."

The principal object of this report is to show the present state of the condensation of muriatic acid. If the Act has been perfectly successful, then the escape of acid is in every individual alkali work less than five per cent. On the next page a few lines show the average amount of condensation and escape at all the works; on page 10 and following is given the amount of escape at the individual works. A large amount of information concerning the condensation of the alkali works has been collected, but by publishing the whole, it might be considered by many, that the report was going beyond the demands of the Act, and if I do err, I wish rather to do so on the side of caution. This is probably a feeling that the first year of the inspectorship may foster in excess, rather than the succeeding years. Besides this reason for reticence on many points, the opinion of the alkali makers, of at least one district, has been very distinctly expressed regarding the propriety of silence on certain points, whilst some have desired that as little as possible should be said on all points. Of course every information regarding any work must be considered private, unless the publication is demanded by the Act or permitted by the owner. Guided by these two rules, the report gives, the summary of the whole condensation; an attempt to give some idea of the condensation previous to the passing of the Act; the present amount at each work; a description of the manufacture of sulphate of soda, the process in which muriatic acid is evolved; and an account of the method of condensation with plans and drawings. In addition, an account is given of the method of testing at the works, various plans having been tried during the year. A few other subjects of general interest in connection with alkali works have been treated as concisely as was found possible. I shall begin with a general summary of the present state of condensation for those who do not wish to enter into the details.

SUMMARY OF THE PRESENT STATE OF CONDENSATION OF MURIATIC ACID.

Actual condensation per cent., 98·72. The average escape of muriatic acid is 1·28 per cent. over the kingdom. This number is obtained by estimating the actual amount escaping at each work.

AVERAGE of the Per-centages at each Work.

—	Condensation.	Escape.
Western District	99·763	0·237
Middle „	99·040	0·960
Eastern „	97·940	2·060
Scotland and Ireland	98·426	1·574

Average, by adding all the per-centages of escape, and dividing by the number of works, 0·9409 per cent., which number is the proper average by which the condensation may be judged.

ACTUAL ESCAPE of MURIATIC ACID per Week in Tons and per Cent.

—	Escape in Tons.	Escape p. c.
Western	4·2786	0·3109
Middle	5·221	1·207
Eastern	26·023	2·1704
Scotland and Ireland	7·195	2·1218
Total escape in tons of dry acid	42·7176	

If all the works were of the same magnitude, these two tables would give per-centages entirely alike. As they stand, the difference is small. To obtain this latter table the amount of escape is calculated from the total quantity of salt used at each work and the condensation per cent. The total amount of salt decomposed per week is 5,762 tons. This gives out 3,324·96 of dry acid or about 13,000 tons of strong commercial muriatic acid in a liquid state. The whole amount would escape if there were no condensation. The effect of the condensation reduces it to 43 tons.

STATE OF CONDENSATION BEFORE THE PASSING OF THE ALKALI ACT.

It is now, perhaps, impossible to ascertain with certainty the amount of gas allowed to escape immediately before the passing of the Act. Some years ago, as is well known, the escape of the whole was allowed; but as the manufacture increased, the public complained more, and the alkali makers erected condensers. Besides this cause, the value of the muriatic acid had been gradually increasing, and its condensation had in some places become a source of profit. Nevertheless it is true that thorough condensation was known to very few, and practised by still fewer, up to the time of the passing of the Act, and it even happened that for some time after inspection had begun 40 per cent. of the gas was in some cases allowed to escape, whilst 16 was a very common amount. Many alkali makers believed that any very refined condensation was impossible, but an examination of the subject showed that habitual complete condensation had been already attained in several cases at the end of the year 1863, if not earlier. Even before I had the honour of being appointed inspector I had become familiar with the possibility of complete condensation, so that all fear of pressing on an improvement to an impracticable issue was removed from the mind. The ideas of Mr. Gossage, coupled with the skill of Mr. Shanks, first produced at St. Helens the desired result.

If we estimate the escape of muriatic acid gas at 1,000 tons per week before the passing of the Alkali Act, or at least before the introduction of the Alkali Bill into Parliament, we may be considered as taking a very moderate view of the question. This supposes 2,324·96 to have been already condensed, and is a very favourable view of the case. The 1,000 tons left uncondensed are equal to 4,000 tons of 25 per cent. acid, and under one-third of the total amount evolved in the process of decomposing salt by sulphuric acid in the United Kingdom. This quantity amounts to 208,000 tons per annum. The date of the introduction of the Alkali Bill into Parliament is spoken of, as it is believed that alterations began from that period, some of the manufacturers not having waited until the passing of the Act. At the same time it may be said that the changes then made, referred more to carefulness in the operations than improvements in apparatus.

Mr. Shanks has written a short summary of his recollections of the introduction of condensation, and the following is extracted from his letter :—

" In the year 1837, I engaged to erect condensers in several parts of the country, Liverpool, St. Helens, Newcastle, South Shields, &c.

" In 1838, we erected a set of condensing apparatus at Muspratt's works in Liverpool and Newton, but as this was the first attempt (always excepting what Mr. Gossage himself did at the British Alkali Works in Worcestershire, see his paper on the "soda manufacture," read at the British Association in 1861,) it was not carried out in a proper manner at that time.

" At the end of 1838 we erected three sets of condensers in the St. Helens district, to Crosfield, Bros., & Co., Clough, and Morley, all which worked well and gave very satisfactory results as to condensation at that time.

" At the end of 1839 I engaged to erect three separate sets of condensers at Jarrow, South Shields, John Lee & Company's works, Felling at Gateshead, and John Allan & Company's. These were all erected under my personal superintendence and during the year 1840.

" These were each and all set to work and condensed HCl (muriatic acid) very satisfactorily. At this period I left to undertake the management of the works of which I am still the superintendant and part proprietor.

" In all these cases, and for anything I know to the contrary, some of the condensers may be doing duty still.

" I commenced my duties here in the early part of 1841 with the condensers I had erected three years before, since which period I feel satisfied we have not allowed any escape of HCl gas to injure any vegetation in our neighbourhood.

" In the year 1846 we defended in a suit brought against us, on which occasion we had the assistance of Dr. Miller of King's College, the late Dr. Brett of Liverpool, and others, who testified to the *complete* and *thorough condensation* of our HCl gas, but as damage had been done and we were in the neighbourhood of other chemical works of the same kind, we were mulcted to the extent of *one-twelfth* of the alleged extent of the damage sued for.

" From the date of this trial down to the present moment we have subjected ourselves to the test of *nitrate of silver* solution, and have scarcely detected any precipitate. So that I speak with confidence, when I say that we have not done any material damage to crops or trees during the last *twenty-four years.*

" Of course it would be an invidious task for me to hazard an opinion as to who have condensed *carefully or otherwise.* But I have no hesitation in saying that every one almost has very much improved his condensation since Lord Derby introduced the subject of late.

"I would only add, that when I came here at the beginning of 1841, the parties I have named were those only who had condensers at that time in England. But in Glasgow, C. Tennant & Co., had begun to build large condensers also, in order to get large supplies of muriatic acid for decomposing manganese, as they were changing at that time their mode of manufacturing bleaching-powder from small leaden stills, in which they decomposed the manganese with sulphuric acid, and common salt, to the present mode of using stone stills for holding the oxide of manganese and muriatic acid.

"From that date manufacturers began to entertain the notion that large stone or brick condensers were better adapted for condensing large quantities of HCl. So that within the last ten or fifteen years no one ever seems to have thought of erecting apparatus for the production of sulphate of soda from common salt, without also building condensers.

Mr. Fletcher has obtained the probable amount of escape per week from ten of the works in the Westland district, up to 1862 or 1863.

No. of work.	Amount of escape.	
8	All the acid from 20 tons of salt or =	$\frac{1}{2}$ of the whole.
11	7½	or $\frac{1}{20}$
16	120	all
17	140	all
18	22½	$\frac{1}{10}$
19	4½	$\frac{1}{10}$
20	5	$\frac{1}{10}$
23	13½	$\frac{1}{2}$
27	35	all
Work at St. Helens ceased	75	all
All the acid from	443 tons	

This is about 255 tons of HCl or muriatic acid gas, or 800 tons of strong commercial muriatic acid thrown into the air by ten works alone.

Seven of these now send out nothing, one sends out 1·5 p. c., another sends out 0·3 p. cent., a third has ceased; nearly 800 tons of noxious vapour are therefore removed from that district alone every week. A person well acquainted with these works for many years considers the above estimate as too low.

Mr. Todd sends the following list of additional and altered condensers made in the Newcastle district:—

No. of work.	Additional condensers.
62	1
53	1
70	1
60	1
55	1

No of work.	Additional condensers.
63	4
65	1
57	1
68	1
59	1
50	2
58	1
66	1 with alterations in the old one.

Improvements in old condensers made at the works numbered.
66
55
67
56

To be made as soon as weather allows :—

at 51 5 new condensers, partly on account of increase of business.
at No. 54 2
at 50 2

The numerous improvements in managing the condensers cannot be particularised, and the greater attention given must be left uncalculated, however important and worthy of remembering.

The progress to the present state has been gradual, and it is fair to give here only the latest results of the examination. In some cases the arrangements have not been completed above a few weeks, in other cases they are not yet completed, so that an improvement is still to be expected. Gradual, however, as the progress has been it has been very rapid. Practical inspection did not begin until March 1864, and now, in February 1865, every alkali work is condensing at least the amount required by the Act, whilst 26 are condensing 100 per cent., and all the others condense more than by the Alkali Act they are compelled.

AMOUNT OF CONDENSATION SHOWN BY THE PER-CENTAGE AND ACTUAL AMOUNT OF HCL ESCAPING.

—	HCl entering condenser in grains per cubic foot.	HCl escaping in grains per cubic foot of air.	HCl escaping grammes per cubic meter.	HCl escape in tons per week.	HCl escape per cent.
No. 1	When there is no escape the amount entering the condenser is of no importance and is not given				0·
2	-	-	-	0·0087	0·25
3	Stopped for alterations.				
4	-	-	-	-	0·
5	-	-	-	-	0·
6	-	-	-	-	0·

AMOUNT OF CONDENSATION, &c.—*cont.*

—	HCl entering condenser in grains per cubic foot.	HCl escaping in grains per cubic foot of air.	HCl escaping grammes per cubic meter.	HCl escape in tons per week.	HCl escape per cent.
No. 7	- -	- -	- -	- -	0·
8	- -	- -	- -	- -	0·
9	- -	- -	- -	- -	0·
10	- -	- -	- -	- -	0·
11	34·47	0·512	1·171	1·29	1·5
12	- -	- -	- -	- -	0·
13	- -	- -	trace	- -	0·
14	34·3	0·37	0·847	1·36	1·09
15	92·05	1·62	3·706	1·45	1·75
16	- -	- -	- -	- -	0·
17	Stopped.				
18	- -	- -	- -	- -	0·
19	- -	- -	trace	- -	0·
20	781·5	2·34	5·333	0·17	0·3
23	- -	- -	trace	- -	0·
26	- -	- -	trace	- -	0·
27	- -	- -	trace	- -	0·
28	- -	0·1	0·228	0·055	0·16
30	- -	- -	- -	- -	0·
31	- -	0·04	0·091	0·008	0·12
32	- -	0·54	1·235	1·653	4·55
33	- -	- -	- -	- -	0·
34	- -	0·16	0·366	0·363	0·3
35	- -	- -	- -	- -	0·
39	- -	0·06	0·137	0·079	0·24
40	- -	0·40	0·910	0·655	1·67
41	- -	0·23	0·532	0·078	0·63
42	- -	0·14	0·32	0·044	0·54
43	- -	- -	- -	- -	0·
45	- -	- -	- -	- -	0·
46	- -	0·43	0·983	0·202	1·95
47	- -	1·08	2·469	0·072	2·28
48					
49	- -	0·48	1·098	2·012	2·79
50	- -	- -	- -	0·66	0·1
51	- -	- -	- -	5·79	3·24
53	Altering.				
54	- -	·791	1·81	2·78	4·2
55	- -	2·1	4·8	1·396	4·4
56	- -	- -	- -	1·998	3·
57	- -	- -	- -	0·207	0·1
58	- -	·316	0·724	0·704	1·42
59	- -	- -	- -	0·207	0·1
60	- -	- -	- -	0·207	0·1
61	- -	- -	- -	0·207	0·1
62	- -	- -	- -	1·961	0·1
63	- -	2·2	5·	6·713	4·48
64	- -	- -	- -	0·207	0·1
65	- -	- -	- -	0·207	0·1

AMOUNT OF CONDENSATION, &c.—*cont.*

—	HCl entering condenser in grains per cubic foot.	HCl escaping in grains per cubic foot of air.	HCl escaping grammes per cubic meter.	HCl escape in tons per week.	HCl escape per cent.
No. 66	- -	2·8	6·4	0·207	3·7
67	- -	- -	- -	1·384	0·1
68	- -	0·728	1·6	0·207	4·4
70	- -	- -	- -	0·496	0·1
71	- -	0·928	2·05	0·491	1·2
72	- -	- -	- -	- -	2·41
73	206	1·91	4·37	0·04	0·92
79	535	0·5	1·145	0·02 7·195 7·215	0·0089
80	283	0·5	1·259	0·07	0·19
82	83·6	3·22	7·373	0·25	3·75
83	481	0·14	0·3206	0·0029	0·0029
84					

Those marked 0·1 are numbers received after the report was written. The pan condensers allowed an escape of less than one per cent. and nothing was found in the outlet of the roasters; this is the result of great exertions made by the owners to have everything complete, and as the roasters are open it contradicts the remark elsewhere made that close roasters only produce perfect condensation. It is to be hoped that it is not entirely owing to the cold weather and that it really is a permanent effect; at any rate it is the result of the latest observations and must stand to the credit of the manufacturers. The exertions were made in order that the first report might show that the act was in every case carried out effectively, and I scarcely know why I should add any doubt of the continuance of this great improvement except that it has exceeded my expectations and introduces a new feature into the art of condensing.

MANUFACTURE OF SULPHATE OF SODA OR SALT CAKE.

The Alkali Manufacture may be said to mean the manufacture of soda from common salt. The amount of carbonate of potash made from chloride of potassium is comparatively small, although on the increase. The operations are mainly two; first, the decomposition of the common salt by sulphuric acid, the product obtained being sulphate of soda; secondly, the decomposition of the sulphate of soda by coal and lime at a high heat. The first operation gives out muriatic acid, and it is to that alone that our attention is confined.

Common salt in a rather pure white state, although in coarse grains and somewhat moist, is put into a circular cast-iron pot of great thickness, and sulphuric acid is poured upon it.

We cannot do better than use the words in Muspratt's Dictionary:
“ The pan is first heated to a suitable temperature, and the
“ charge of salt amounting to about 16 cwt. is introduced through
“ the doorway. The tile which closes this is now fitted into its
“ place, and the sulphuric acid is run in. It is preferred to use
“ acid of about 1·450 specific gravity and heated to a temperature
“ of about 120° F. so as not to cool the pan more than is necessary.
“ The proportion of acid required is about 1,800 lbs. or 123½ gallons,
“ that being the quantity which, making allowances for water
“ and slight impurities, is just sufficient to convert all the chloride
“ of sodium into sulphate of soda. The charge is usually measured
“ out by filling a small leaden vessel of known capacity placed
“ near or over the decomposing pan, so as to allow the acid to be
“ run in upon the salt by a syphon. The acid and salt having
“ been introduced the tile closing the opening is now removed
“ and the materials mixed with an iron rake. This mixing serves
“ at the same time to prevent frothing by facilitating the escape
“ of gas. The doorway is then effectually closed with the tile
“ and proper luting, and the fire urged under the pan. In the
“ course of an hour nearly all the acid vapour will have been
“ disengaged and the greater portion of the common salt be con-
“ verted into sulphate of soda.”

The weight of a charge here given is 16 cwt., but it will be seen by table at p. 27 that from 5 to 10 cwt. is the amount general. The opening to the pan has a tile or slate laid against it, but this is heaped over with common salt, which combination makes a very effectual door.

In the pan just described the sulphuric acid seizes the sodium of the common salt, whilst the chlorine which was combined with the sodium is driven off in union with hydrogen.

The decomposition may be represented thus :—

$NaCl$ is chloride of sodium or common salt.

SO_3 HO is sulphuric acid and an atom of water.

The SO_3 or sulphuric acid having a strong affinity for NaO the soda, union takes place, the HO or water is decomposed, the H goes to the Cl or chlorine, the O to the natrium.

The result is NaO SO_3 sulphate of soda, and HCl the hydrochloric or muriatic acid. It may be simplified thus :—

$NaCl$ chloride of sodium,
SO_4 H sulphuric acid.

The Cl and the SO_4 change places, and so we have as before Na SO_4 and HCl muriatic acid.

The amount of muriatic acid given off in this way is easily calculated.

Na has an atomic weight of - -	23·
Cl - - - - -	35·5
Atomic weight of common salt -	58·5

the HCl which comes off is 35·5 + the atomic weight of
hydrogen which is equal to 1
the atomic weight of muriatic acid 36·5

36·5 is 62·39 per cent. of the common salt used, but the salt is not used absolutely pure, although almost free from any impurity except moisture. The moisture may be taken at 6 per cent. according to Mr. Clapham, but it varies from 5 to 8, and the impurities are about 1 to 2. If we take 58·5 per cent. as the amount of muriatic acid driven out from the salt we shall probably be as near as any such varying number can be attained, but we must also allow for some undecomposed salt which may reduce the amount to 57·7 per cent.

The process in the pan does not remove all the muriatic acid, the heat is not sufficiently great, and from the nature of the material it is not well to add much heat to the pan. Frequent heating and cooling would destroy it soon. Even now the pans are often cracked after a few days' use by the acid or the salt being too cool, the mixture of acid and salt soon becomes liquid and ebullition takes place disengaging the muriatic acid, of which about 70 per cent. is here removed. After awhile the mixture becomes pasty; if it were allowed to cool it would become solid, it is then removed to a furnace in which it is roasted until the remaining 30 p. c. or nearly so of muriatic acid is driven off. The apparatus in which this is done is called a Roaster or Dryer.

CONDENSATION OF MURIATIC ACID.

When muriatic acid gas was given out in quantities so large as to attract public attention, one of the earliest cures suggested was condensation in large shallow tanks.

This method was practised by Mr. Lutwyche in Liverpool and still earlier as I am informed by Mr. Hill in the same neighbourhood. The same practice is continued, and both works may be seen after an existence of something like 50 years.

The large tanks are renewed occasionally, being re-floored with pitch and brickwork. Mr. James Muspratt had not at that time made the manufacture of soda ash from salt a matter of national importance.

Mr. Harrison Blair also uses tanks of this form; those at present in use at his works are of the dimensions of 120,000 cub. feet and serve for the first tower. The acid is made to pass along the surface in flues which divide the tank in lines, although the acid below communicates freely from side to side These tanks may be found to act very well for pan condensers, although even then they must be very large, whilst for roaster condensers their value is less apparent.

Even the large tanks at Mr. Blair's must be supplemented by towers, and the space they occupy is one very great objection.

This plan does not seem to have gained much favour. However, the value of the acid was small whilst that of the soda ash was great, and a readier method was for a long time adopted. A chimney was raised so high that the gas was expected to fall only after it had mixed with an amount of air so great as to diminish all the deleterious effects to a point where they became imperceptible.

It was expected that the gas would pass into the atmosphere according to the laws of diffusion, which were but little known, and seemed to promise therefore results which never appeared. It was even found that the muriatic acid did not act as a gas at all, but after uniting with water was in reality an acid mist which varied according to the hygrometric state of the air. The lofty chimney at Mr. Muspratt's works at Newton in Lancashire, and the still loftier chimney at Glasgow above 400 feet in height and itself standing on an elevation, were unable to disperse the dreaded acid over a sufficiently extended space. The vapour might be traced even to a distance of several miles, some say 30, but the extreme distance has never been ascertained. All opportunity for making this interesting observation has ceased, as Messrs. Tennant & Muspratt have condensers of great extent.

Mr. Muspratt after leaving Newton erected a new work in Flintshire, and with it a series of 24 condensing towers.

The chimney system failed. In order to introduce the description of the new method adopted and at present in use, I shall here quote from Mr. Gossage's History of the Soda Manufacture :—

" Many plans suggested themselves, and amongst others I " devised certain means for effecting this object, for which I " obtained a patent in the year 1836. Having demonstrated the " practicability of effecting a complete condensation of hydro-" chloric acid, by the erection and working of a complete set of " apparatus at the soda works with which I was then connected, " I introduced the plan to the trade and it has been subsequently " adopted by every manufacturer of soda in the kingdom.

" The principle of this invention consists in causing the acid " gas to percolate through a deep bed of coke in small lumps, " contained in a high tower, at the same time that a supply of " water flows very slowly over the surfaces of the pieces of coke. " By these means an almost unlimited extent of moistened sur-" faces may be presented to the gas (the currents of which are " being continually changed in their direction) for effecting its " absorption ; and as the same fluid descends through the tower " it meets with more gas, and gradually becomes charged to " saturation ; whilst at the upper portion of the tower any gas " which might otherwise escape is exposed to the absorbing " power of unacidulated water. When this apparatus is used " judiciously a *perfect* condensation of the hydrochloric acid gas " can be effected. This has been proved satisfactorily at the " works of Messrs. Crosfield, Brothers, and Company, at St.

" Helen's, where the acting partner Mr. Shanks, my friend and
" former pupil (who was the first after myself to adopt my in-
" vention), has effected such complete condensation of the gas
" proceeding from the decomposition of 25 tons of salt per diem
" that the escaping gases passing from the apparatus being caused
" to bubble through solution of nitrate of silver, contained in a
" set of Liebig's bulbs, not the slightest turbidness was produced
" although the same solution was retained in the apparatus and
" used for many trials. By these means was removed one great
" obstacle to the development of the soda manufacture; and
" although my reward has been the reverse of a pecuniary benefit,
" it is highly satisfactory to know that all the soda manufacturers
" are reaping great advantages from my labours."

MODES OF PROMOTING CONDENSATION.

General.

Condensation is promoted by cold and by water mainly, but next to these we must add contact of surfaces and time.

Air with a very small quantity of muriatic acid in it will appear misty in moist weather, the amount may be less than 0·003 per cent. It will pass rapidly through tubes well cooled and still appear misty, but let it pass between broken pieces of coke or through extremely narrow moist passages and it will be perfectly cleared. The floating particles too minute to fall seem to be filtered out as we filter fine precipitates. The mode of gaining extensive surface is chiefly by the use of coke in the towers. The gas cannot find a passage through the finer particles of the coke and cannot make use of the enormous internal surface in a direct manner. The pieces of coke become filled with liquid acid and present only the external surface to the gas, as pieces of stone, would do, but the inner surfaces act indirectly. The pure water first enters, the gas arrives, rendering the outside water acid and must then diffuse into the centre; the centre will send out the pure water which will be in its turn made acid; fresh water will come down, which will enter so as to meet the acid which has arrived at the centre, and so a constant action will be in progress from the outer to the most internal and minute crevice of the whole porous material.

The breaking down of the coke causes also extreme tortuousness in the great passages of the gas and greatly facilitates condensation.

Other modes have been adopted of filling the condensers. Firebricks are used in many cases, and especially at the lower part of condensers used for open roasters.

In such cases, that is where there are open roasters, the amount of air mixed with the gas and coal smoke is so great that wide passages are needful. They are, however, gradually contracted as the gas condenses and becomes absorbed. This will be seen in Plate IV.

It is probable that with earthenware or bricks the condensation will be very regular, as the whole of the tower will be preserved in effective work more readily than with coke, the passages not being so apt to fill. Again, the want of porosity is a disadvantage. The proportionate value, however, of the two plans has not been fully measured.

Another mode of filling the condensers has been patented by Mr. Collier. Instead of bricks, blocks of perforated earthenware are used. The blocks may be called a bundle of tubes. The blocks are cubical. They are laid one on another, not fitting one tube exactly to the one below or above it, but putting it to the side a little so that there may be a narrowing of the neck, and by this means a little winding produced to lengthen the passage of the gas. There may be a value in each of these methods. I have not seen any comparative statement of the effective power of each, and I believe that nothing is known very exactly on the subject. It will be seen that the amount of condensation in different establishments varies from many causes. The effect due to each is known imperfectly. The largest condensers will of course produce the best condensation, all other things being equal; but in actual practice this equality is not found in all individual cases, and the larger condensers sometimes fail to produce results easily attained by smaller. Time is of the utmost importance. Gas is frequently dragged so rapidly through a large and otherwise efficient condenser as to pass out little affected.

CONDENSERS.

A condenser generally is a tower filled with moistened very porous or non-porous material in pieces so large as to allow the passage of air and water through the interstices, and so small as to prevent that passage from being made without contact of the air or gases with the water and the solids present.

It is built generally in the form of a square tower. It is from three to six feet square equally from base to summit, and from five to 125 feet high. This height includes the pedestal and the cistern above the condensing portion of the tower.

1st. The simplest form allows the gas to enter below whilst the uncondensed portion escapes into the air at the top.

2nd. The uncondensed gases of the first tower may be sent into the top of the second tower, down which they may pass and thence either to the chimney or to a third and fourth tower.

3rd. A tower may be divided into two parts. The gases may pass up one side and down the other. This merely treats one as if it were two.

4th. The gases may pass up one tower and down (earthenware) pipes to the bottom of the second tower, up which they rise. By this method the gases pass up the towers only and down tubes only.

5th. Condensers may be vessels of stone or of earthenware; when of stone they may be several feet in length, breadth, or depth. In these vessels a large amount of acid is frequently condensed before it passes to the towers. The gases may pass through several of these tanks.

6th. As the gases come from the roaster very hot it is found of advantage to cool them before they enter the condenser. This is done by allowing them to pass along earthenware pipes for a great distance before entering the condensers. When these pipes are not used the condenser is heated very highly and filled more or less with hot instead of cold water. This is the case sometimes to such an extent as to warm the whole tower. A great supply of water cools the tower but weakens the acid, and may even obstruct the passage of the gas too far.

7th. The first condenser is made large enough to condense all the gas, or several may be required. The greater part of the gas may be removed by one or more towers, leaving a small amount to be condensed by a post-condenser flushed with a great excess of water. This acid is not intended for use. Sometimes several condensers are connected with one post-condenser for a final washing. A greater amount of space and water being required to remove acid when it exists to the extent of only two or three per cent. the acid from these washings is often very dilute, sometimes so much so as not to be sensible to the taste.

Arrangement of Apparatus.

The pans in which salt is decomposed are made nearly always alike, but there are two kinds of roasting furnaces, the blind or close and the open. There are, however, numerous variations of details which are of little importance to those who desire only a general knowledge of the subject, but which become of the very first importance when an exact result is to be attained; we may mention—

1st. A pan and a close roaster, the gases from each passing together into the condenser.

2nd. A pan and an open roaster. The gases from both joining the gases from the coal or the products of combustion and passing on to the condenser.

3rd. A pan leading to a close-condenser or one having no opening at the top, but supplied with a pipe leading from the top to the bottom and hence to the chimney.

A close roaster, the gases being led to a separate condenser.

4th. A pan with close condensers.

Open roaster, as in 3d, the gases from which mix with the chimney gases entering a condenser separate from that connected with the pan. The smoke passes along with the acid through the condenser.

5th. A pan with an open condenser. This condenser has an opening at the top for the escape of the uncondensed gases. Roaster open, with separate condenser.

No. 1 arrangement is adopted at St. Helens by Mr. Shanks and others. The condensation by this means may be made absolutely perfect. There is found more gas floating in the atmosphere of portions of some works than there is in these tubes from the condensers. At Messrs. Chance's works there are chambers which are merely enlargements of the outlet tubes. These may be entered readily, and at times it is difficult even to smell muriatic acid. Lime is placed in these chambers in order to remove the last traces. I doubt the value of the lime as it is placed, but that is another point. A drawing of Mr. Chance's arrangements will be seen on Pl. IX.

2. A pan and an open roaster. The condensation here cannot be expected to be so complete as on the previous plan; the escape may be easily reduced under 2 per cent. by the arrangements at several works.*

3rd. This plan separates the acid from the roaster and pans very distinctly.

4th. The pan condenser here is complete, but the open roaster is subject to the incomplete condensation as at No. 2. As in this case and the next, the condensers attached to the roasters are much smaller than those attached to the pans, whilst the stream of gas and smoke is greater; the condensation is more difficult than on any other plan, and the principal changes made have been caused by this arrangement. The roasters give out from 25 to 33 per cent. of the muriatic acid gas and the towers have on that account been made smaller, whereas the great heat and the rapidity of the current appear to call rather for greater condensers.

5th. This plan is almost universal on the Tyne. It is believed that there is an advantage in observing the amount of escape of muriatic acid from the little chimney placed above the pan condenser. It is supposed that when the amount is apparently small little escapes. To a great extent this is true, but it is not an indication of great value, as the same amount appears different according to the moisture of the atmosphere. One or two per cent. may be escaping when it is said that nothing but steam is going off. It suits only the pan, not the roaster condensers. This has been overlooked when the subject has been treated.

Another objection to this plan affects the inspectors; it is the difficulty of mounting to the summit, and when there of working calmly at a height of 125 feet on a platform slenderly railed under a strong wind and even rain. One may occasionally stand for an hour under these conditions. It is possible to mount the firm stairs leading up to Mr. Allhusen's tower cisterns, to stand upon them, and to examine the gas at the small chimneys of escape, but it is not a duty which inspectors would like to perform frequently However, very few of the towers can be so mounted, and as a rule it may be said that inspectors who are not equal to sailors in climbing cannot make examinations at the summit of the towers. Even sailors could not take up the apparatus. This, however, is only an inspectors' difficulty which must be overcome. The method of overcoming it is by drawing the gas down through small tubes.

---

* Since this was written I have been informed by Mr. Todd of several cases in which the condensation has been, even with this arrangement, perfect. However, the apparatus was in each case quite new, and one cannot yet be sure of such a pleasant result at all times. I may require to change this opinion.

Respecting the advantages of each of these systems of condensation it is not for me to speak, except on a very partial view of the case. The close furnaces certainly have given the best results so far as condensation is concerned, and all the examples of perfect condensation are with close furnaces. (See previous page.) Mr. Hutchinson, of Widnes, informs me that there is great danger of driving the acid through the brickwork of close furnaces and sending it into the chimney. Against this evil we have made some attempt at protection by boring the chimneys and examining the gas there. We have not yet found ourselves deceived by such furnaces, but this may possibly arise from want of experience, and we must not neglect Mr. Hutchinson's warning. Trials have been made frequently from the very beginning as I was early aware of the possibility of such an escape. The open furnace is not so liable to this objection, if it be at all liable. If we avoid this leakage into the chimney the close furnace is by far the best condenser, and as by it we attain complete condensation it is certainly likely to be a favourite with the public and with the inspectors. However I shall not attempt to speak decidedly in favour of either until I shall have had more experience of their value.

There are other points of difference bearing on the question financially, points which must be considered by the owners but not by the inspectors.

Plans and Drawings of Furnaces and Condensers.

Dr. Blatherwick has sent a drawing of a pan and close roaster. It is taken from the works at St. Rollox, Glasgow. It is seen at Plate I. and is so clear as not to require explanation. The pan is at the left of the roaster hearth, the two exit pipes rise up and meet and pass on together to the tower or condenser.

Plate II., figs. *a*, *b*, *c*, is a working drawing of a close roaster or dryer as built by the Blaydon Chemical Company. It is so complete that no explanation is wanted. The smoke does not pass along with the acid but has a separate flue by which it reaches the chimney.

Plate III., figs. *a*, *b*, *c*, and *d*, shows an elevation, section, and ground plan of decomposing pot and roasters on the open system. The smoke and heated gases from the fire pass over the salt which is to be roasted, and carry with them the escaping muriatic acid. The drawings are given by John Hutchinson, Esq., of Widnes. It will be observed that each pan or pot has two roasters, the operation to be performed in the latter requiring so much more heat. Two-thirds to three-fourths of the acid are driven off from the pan with a very moderate heat, a fourth to a third is driven off in each roaster at a very much greater heat.

Plate IV. represents a series of towers for condensing by the open process. They are the older towers from the works of Mr. Hutchinson. The newer and larger towers are handsomer, but they would not give so clearly the actual condition of the tubes in so much variety. Bricks are used, the spaces narrowing as the gas condenses and cools. A new set is in progress.

Plate V. gives the plan of Messrs. Allhusen's Tyne Chemical Works, with sections of the furnace pans and towers. The furnace and pans are seen as is usual next each other, so as to open a communication for the transference of the charge from the pan to the furnace. The gas from the pan goes to the large condensers called on the plan "strong acid condensers." The furnace or roaster communicates with the "weak acid condensers." The towers are shown in section, and at the left is a plate showing their position in the works.

The weak acid or roaster condensers are numbered from 1 to 6, a seventh for occasional use is numbered 3·5. It will be seen that all these communicate with the great chimney. Nos. 2 and 3 are nearest, and the draught through them is more violent than through the others.

No. 2 is an up and down cast condenser of 29 feet. The escape of gas is greatest from this; we shall call the amount, for the sake of convenience, 10.

No. 3 is an up-cast condenser only, with a pipe to lead to the flue. The escape of gas here (keeping to proportions, not actual numbers) is 5.

This is greatly in favour of the up-cast condensation, as elsewhere, p. 25 illustrated.

Nos. 4, 5, and 6 are up and down cast shafts, like No. 2, but the escape from these three is much less.

From No. 4 it is 2·4.
„ No. 5 „ 3·4.
„ No. 6 „ 3·4.

Nos. 5 and 6 are the only two which are in the same condition, and the escape is the same.

They are less violently acted on by the chimney, and the condensation is better in the proportions—1st, 10; 2nd, 3·4; 3rd, 2·4. The condenser No. 3 has a separate advantage by which it condenses better than 2, but its great height 54 feet is not able to bring it equal to No. 4 with its moderate draught.

The difference in the success of these condensers was pointed out to me by Mr. Brereton Todd.

Plate VI. is a drawing in elevation of the fine towers at Messrs. Allhusen's. The stairs are entirely within the enclosure made by the six towers, and can be ascended with perfect safety. The chamber at the top contains the cistern and arrangements for the distribution of the water. At the very top are openings for the uncondensed gases. There are two rows of three towers making 6 towers for the pan gases.

Plate VII. gives a plan of the Walker Alkali Works, by Mr. Cail. It shews a cast-iron vessel lined with gutta percha, in which compressed air drives the weak acid up the towers to receive a further charge of gas, according to Mr. Clapham's patented plan.

Plate VIII., a plan of Mr. McLiesh's works at Belfast, where a mode of using mixed cisterns and towers is seen. This plan, by Dr. Blatherwick, scarcely requires explanation. The cisterns are of stone.

Pl. IX. is a tower at Messrs. Chance's works.

It will be observed that the gas is led down to the chimney through a small chamber with a door and window. This may be entered, and we may, by shutting the door closely, stand in the current as it passes from the condensers. Sometimes we can scarcely perceive anything. At no time has it been observed that the gas was very offensive, even in that confined space.

Defects of Condensers.

Condensers may fail from being too loosely packed, the pieces may be too large, and the obstruction to the gas insufficient. In this case some pieces of coke may break down and render one part much more compact than another. The gas will take the easiest road and a large portion of the condenser may be rendered quite inactive. From this cause some externally large condensers are in reality very small in the really effective part.

The condenser may be packed too tightly. In this case the obstruction may be so great as to prevent proper passage of the gas, but it generally happens that some portion is a little freer than others. The gas and water pass through it perhaps in a narrow stream, and the result is exactly the same as in the previous case.

Condensers may incline from the perpendicular. In this case the water does not fall down equally, and the gas follows in the portion that is dry because there is less obstruction to it. A very large condenser with much water may thus be rendered valueless. To prevent the loss of such condensers projections are made in the side, I believe of wood, and the water is thrown off from the straight passage which it had made for itself. In any case it is difficult to avoid losing a portion of the space, which will be great according to the angle of inclination of the condenser.

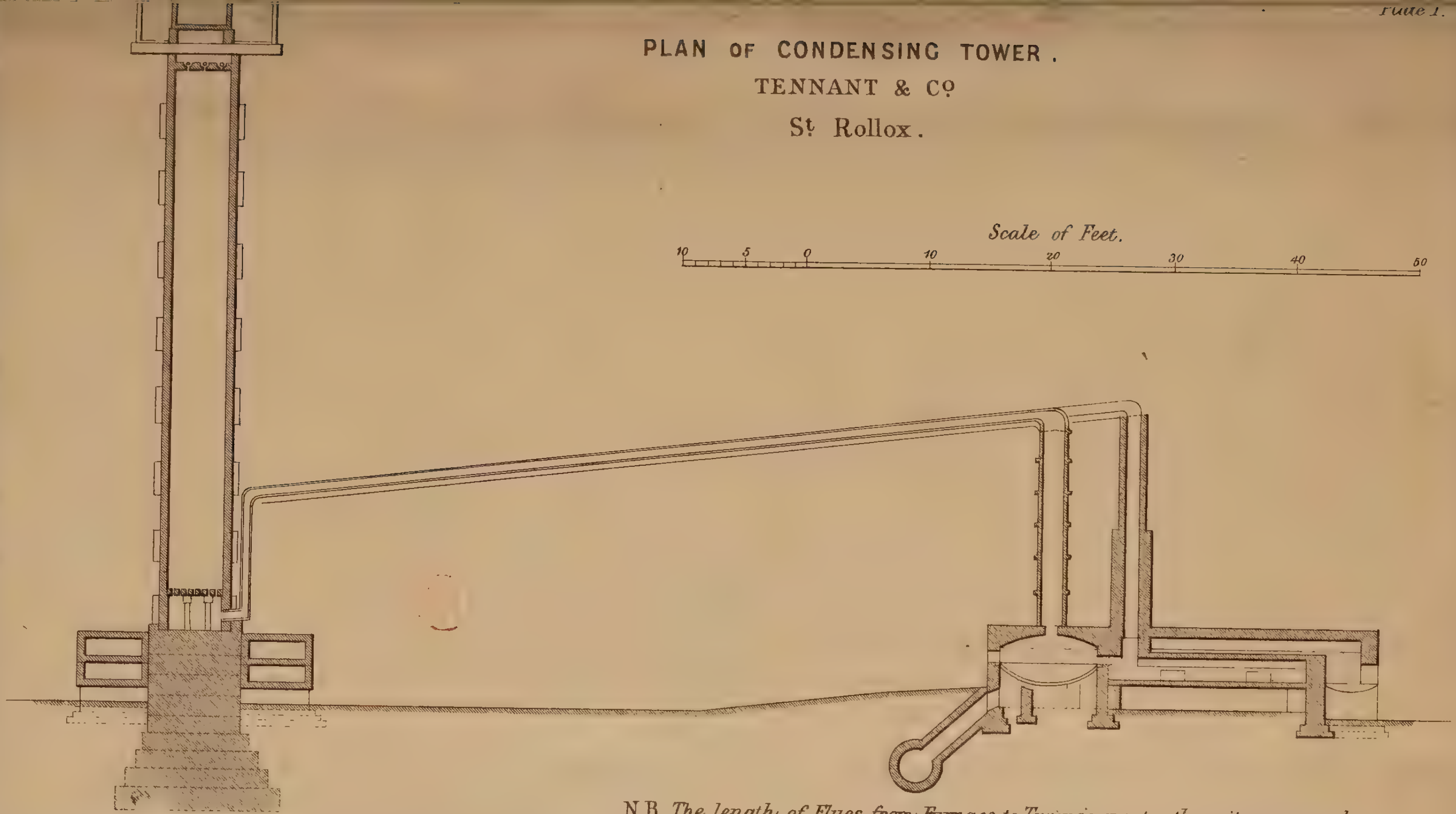
A common fault of condensers is that they are too small. This evil it is attempted to remedy by an increased supply of water. To some extent this is a cure, but the limit is easily reached. The condensation requires a certain time, and no amount of water that can be passed down condensers which are much too small can take the place of increase in size. A large

Plate I.

PLAN OF CONDENSING TOWER.

TENNANT & C^o

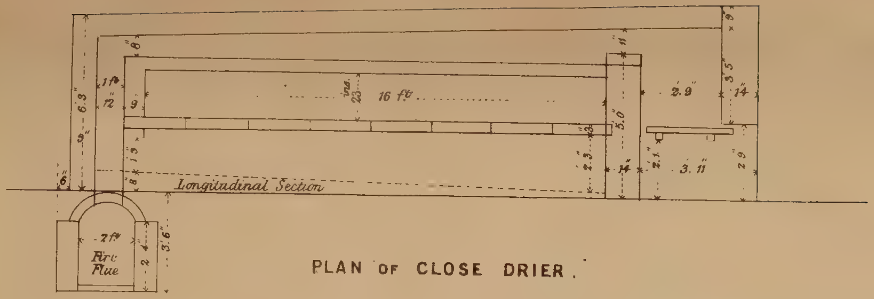
S^t Rollox.


Scale of Feet.
10
5
0
10
20
30
40
50

N.B. *The length of Flues from Furnace to Tower is greater than it appears above averaging 125 feet. i.e. 250 ft of Piping (12 in. d. & 18 D^o)*

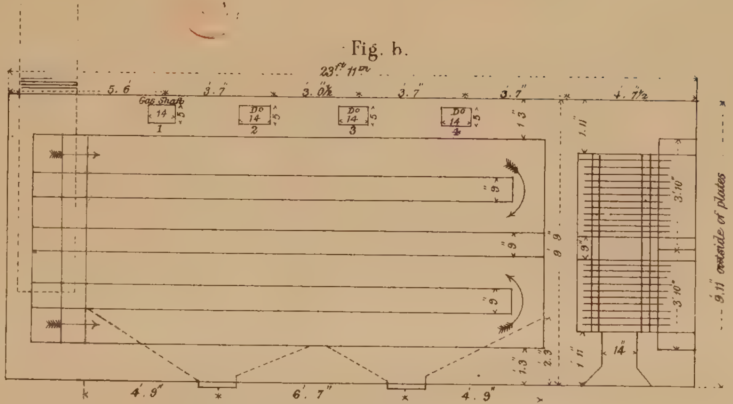
Day & Son Limited, Lith.

Fig. a.


Longitudinal Section
Fire Flue
2 ft
16 ft
23 ins
6.3"
9"
1 ft
12"
9
8"
1.3"
8"
6"
2.3"
5.0"
3"
14"
11"
2.1"
2.9"
3.11"
3.5"
14"
9"
2.9"
3.6"
2.4"

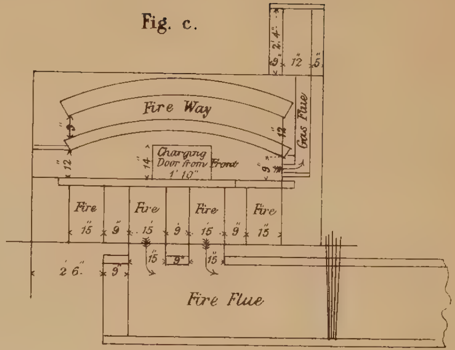
PLAN OF CLOSE DRIER.

Fig. b.


23 ft 11 in
5.6
3.7"
3.0½"
3.7"
3.7"
4.7½
Gas Shaft
14
5
1
Do
14
5
2
Do
14
5
3
Do
14
5
4
1.3"
1.11
9"
9"
9"
9.9
9"
3.10"
3.10"
14"
1.11
2.3
1.3
9.11" outside of plates
4.9"
6.7"
4.9"

GROUND PLAN.

Fig. c.


Fire Way
Gas Flue
Charging Door from Front 1.10"
Fire
Fire
Fire
Fire
15"
9"
15
9
15
9"
15"
15
9"
15
2.6"
9"
12"
14"
12
9"
9
2.4"
12"
5
9"
Fire Flue

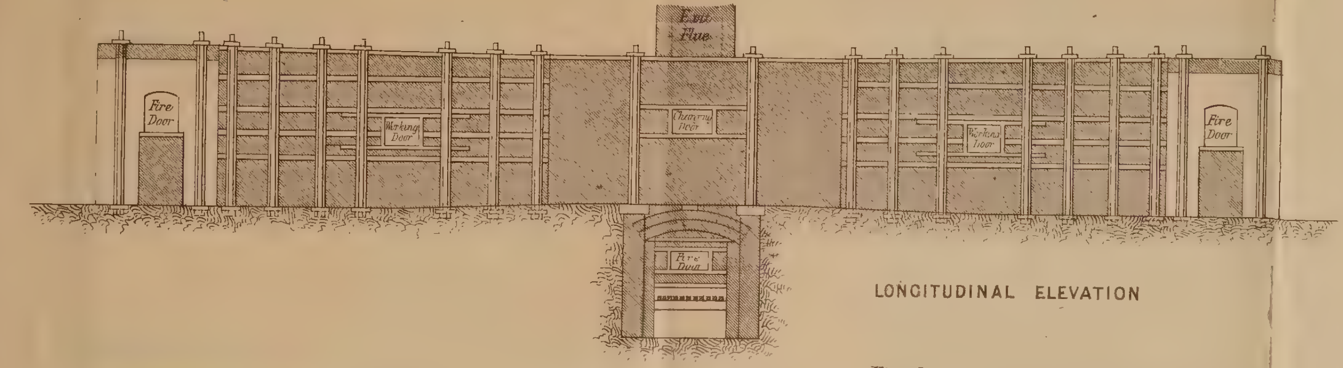
CROSS SECTION.

Scale ⅛ inch to a Foot.

Day & Son Limited, Lith

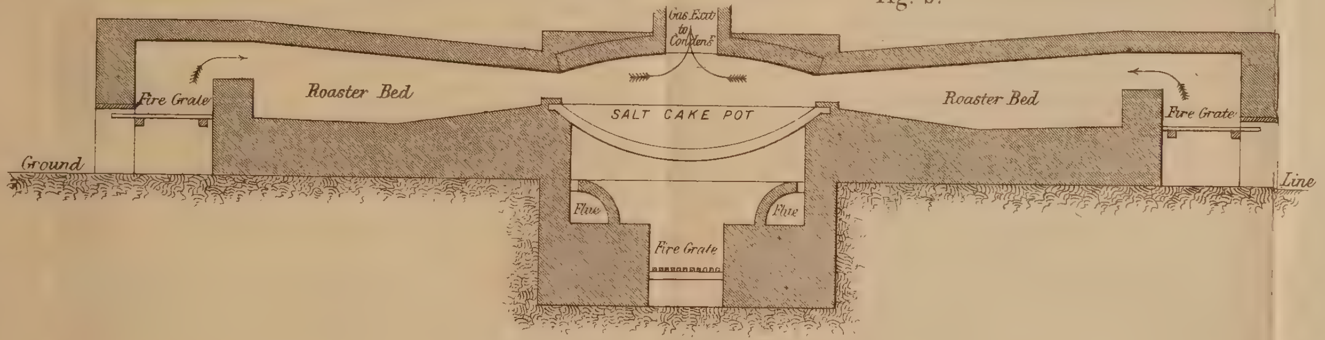
PLAN AND SECTIONS
OF
SALT-CAKE FURNACE
WITH DOUBLE ROASTER

Fig. a.


Exit Flue
Fire Door
Working Door
Charging Door
Working Door
Fire Door
Fire Door

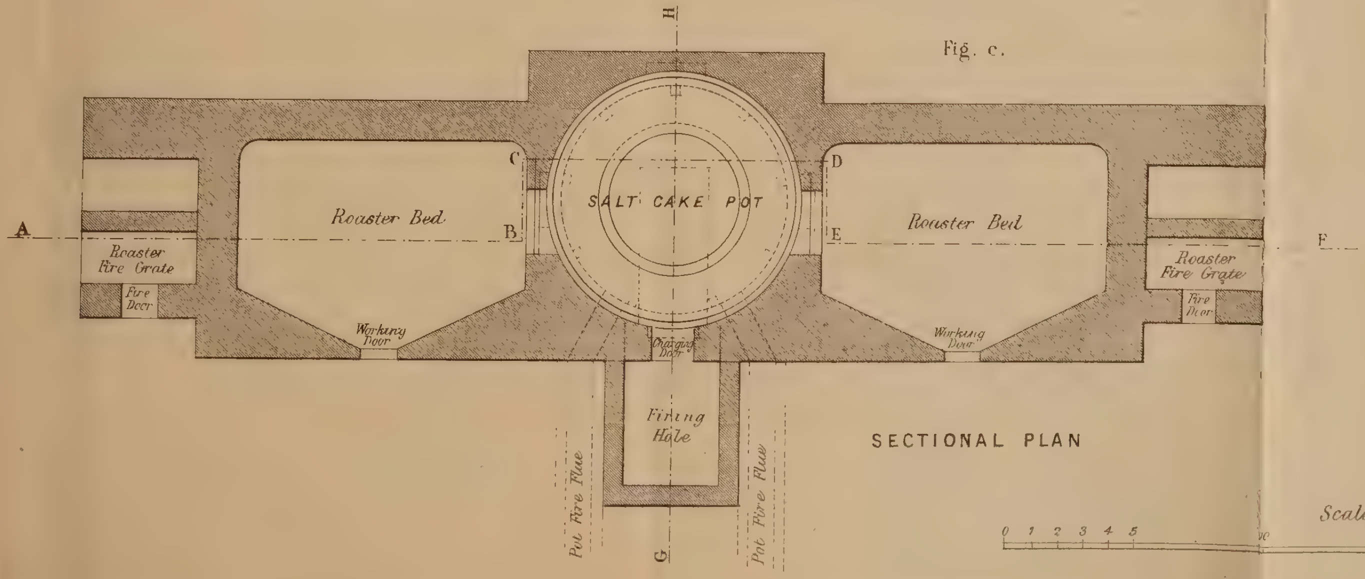
LONGITUDINAL ELEVATION

Fig. b.


Gas Exit to Condensr
Roaster Bed
Roaster Bed
Fire Grate
Fire Grate
SALT CAKE POT
Ground
Line
Flue
Flue
Fire Grate

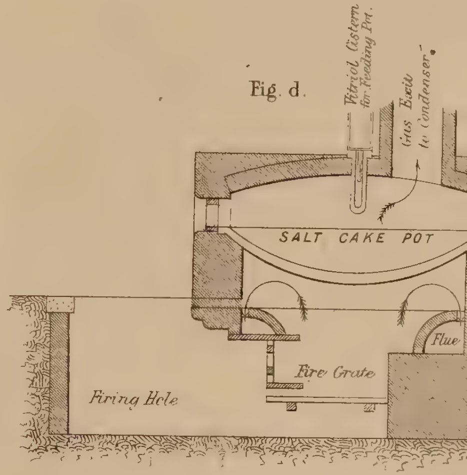
LONGITUDINAL SECTION A.B.C.D.E.F.

Fig. c.


H
C
D
A
B
E
F
Roaster Bed
SALT CAKE POT
Roaster Bed
Roaster Fire Grate
Fire Door
Roaster Fire Grate
Fire Door
Working Door
Charging Door
Working Door
Firing Hole
Pot Fire Flue
Pot Fire Flue
G

SECTIONAL PLAN

Fig. d.


Vitriol Cistern for Feeding Pot.
Gas Exit to Condenser
SALT CAKE POT
Flue
Fire Grate
Firing Hole

TRANSVERSE SECTION G. H.

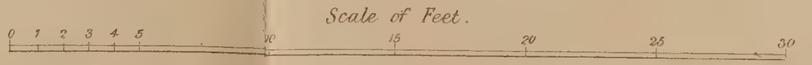
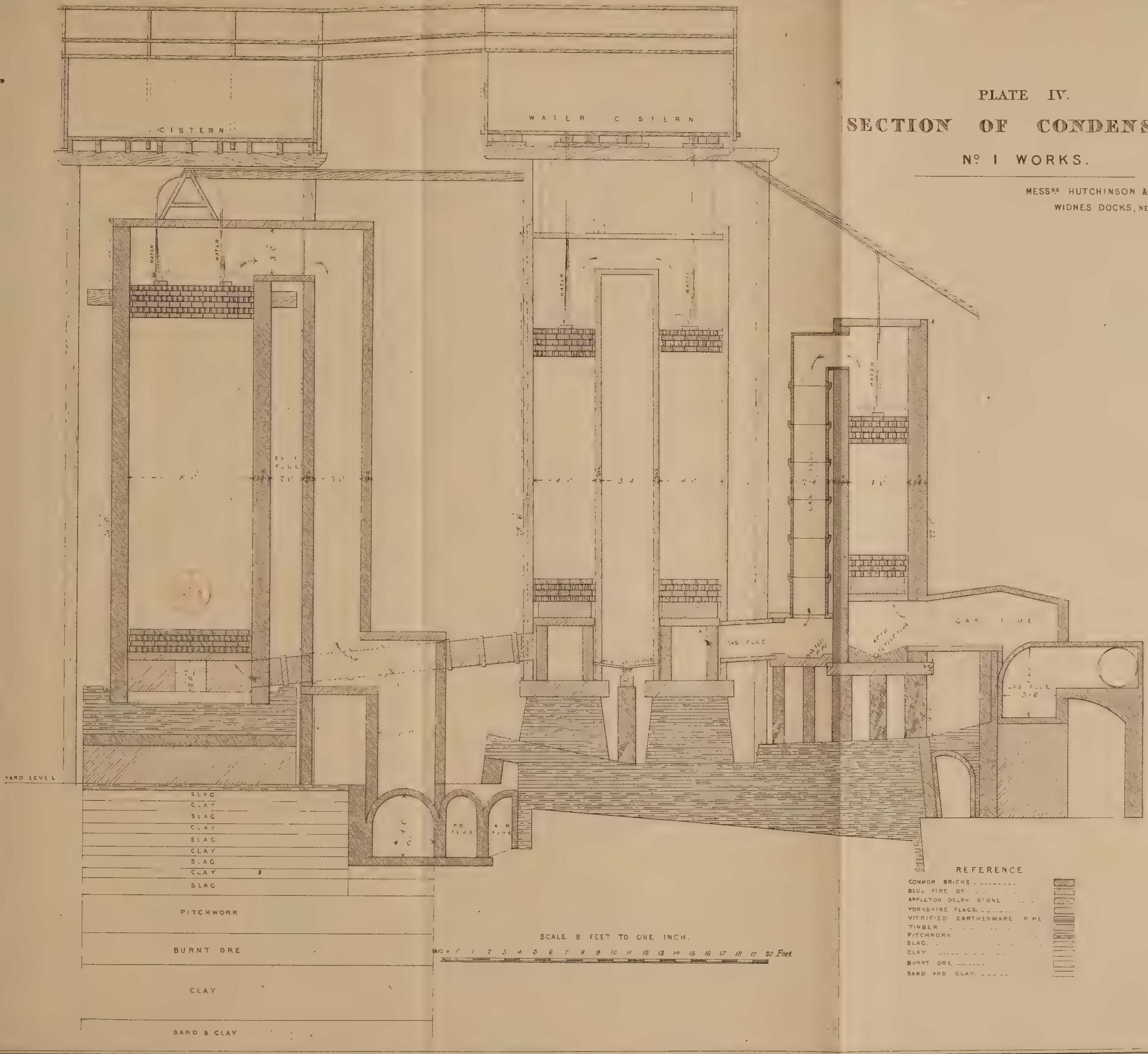

Scale of Feet.
0
1
2
3
4
5
10
15
20
25
30

PLATE IV.

SECTION OF CONDENSERS.

No. I WORKS.

MESSrs HUTCHINSON & Co
WIDNES DOCKS, NEAR WARRINGTON.


CISTERN
WATER CISTERN
WATER
WATER
3' 0"
EXIT FLUE
8' 0"
14
3' 0"
3' 0"
30' 0"
28' 6"
4' 0"
3' 4"
4' 0"
3' 4"
GAS FLUE
4' 0"
14"
GAS FLUE
OUTLET PIPE
ACID OUTLET FLUE
GAS FLUE
GAS FLUE
3-6
YARD LEVEL
SLAG
CLAY
SLAG
CLAY
SLAG
CLAY
SLAG
CLAY
SLAG
PITCHWORK
BURNT ORE
CLAY
SAND & CLAY
4' 0"
4' 6"
PO FLUE
AIR FLUE
12 6 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 Feet.

SCALE 8 FEET TO ONE INCH.

REFERENCE

COMMON BRICKS
BLUE FIRE Do
APPLETON DELPH STONE
YORKSHIRE FLAGS.
VITRIFIED EARTHENWARE PIPE
TIMBER
PITCHWORK
SLAG.
CLAY
BURNT ORE
SAND AND CLAY.

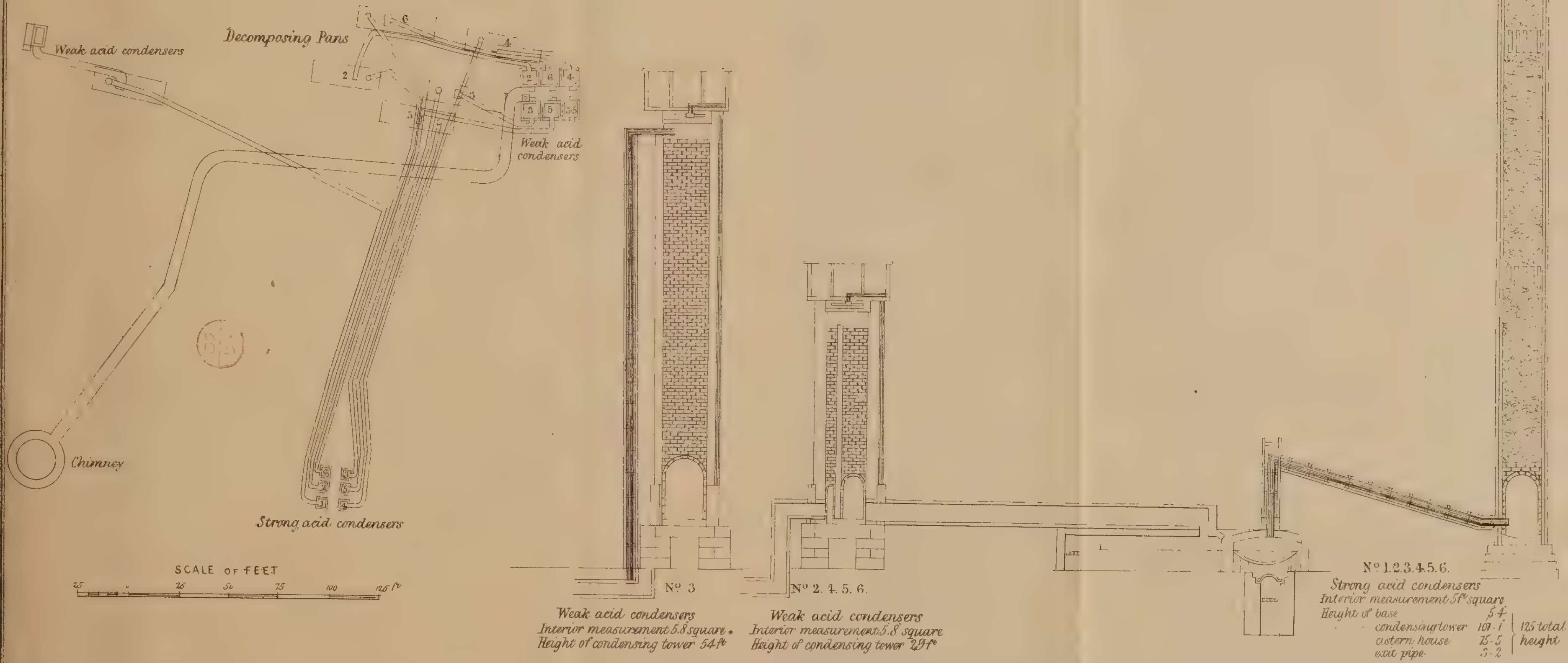
Day & Son (Limited) Li

PLATE V.

PLAN AND SECTIONS

SHEWING THE SIX DECOMPOSING PANS
SIX WEAK ACID AND SIX STRONG ACID CONDENSERS
in use at the

TYNE CHEMICAL WORKS.


Weak acid condensers
Decomposing Pans
1
2
3
4
5
6
2
6
4
3
5
5
Weak acid condensers
Chimney
Strong acid condensers
SCALE OF FEET
25
25
50
75
100
125 ft
Nº 3
Nº 2. 4. 5. 6.
Nº 1.2.3.4.5.6.

Weak acid condensers
Interior measurement 5.8 square.
Height of condensing tower 54 ft

Weak acid condensers
Interior measurement 5.8 square
Height of condensing tower 29 ft

Strong acid condensers
Interior measurement 5 ft square

Height of base	5.4	125 total height
condensing tower	101.1	
cistern house	15.5	
exit pipe	3.2	

Day & Son, (Limited) Lit

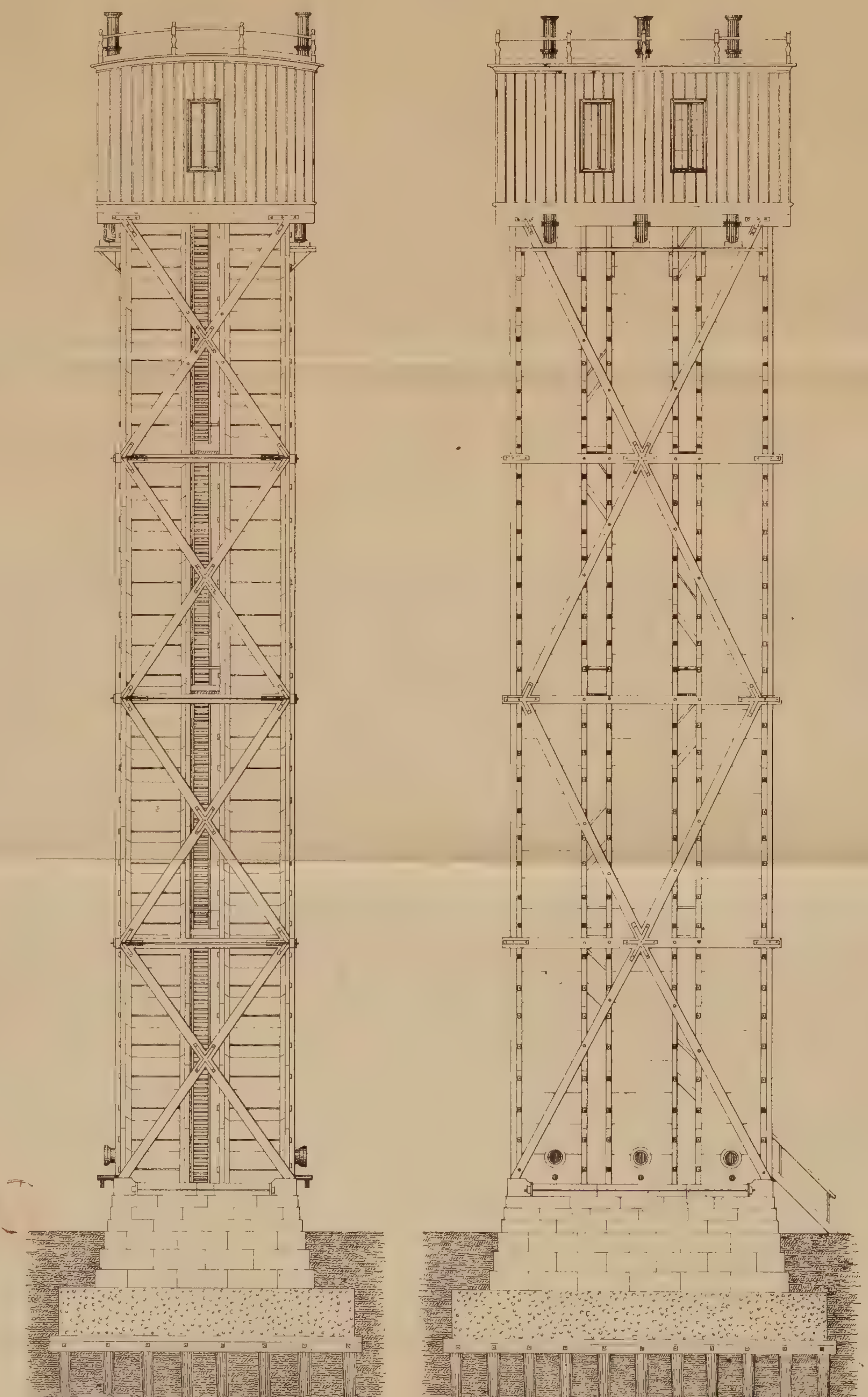
PLATE VI.

SIX STRONG ACID CONDENSERS,

in use at the

TYNE CHEMICAL WORKS,

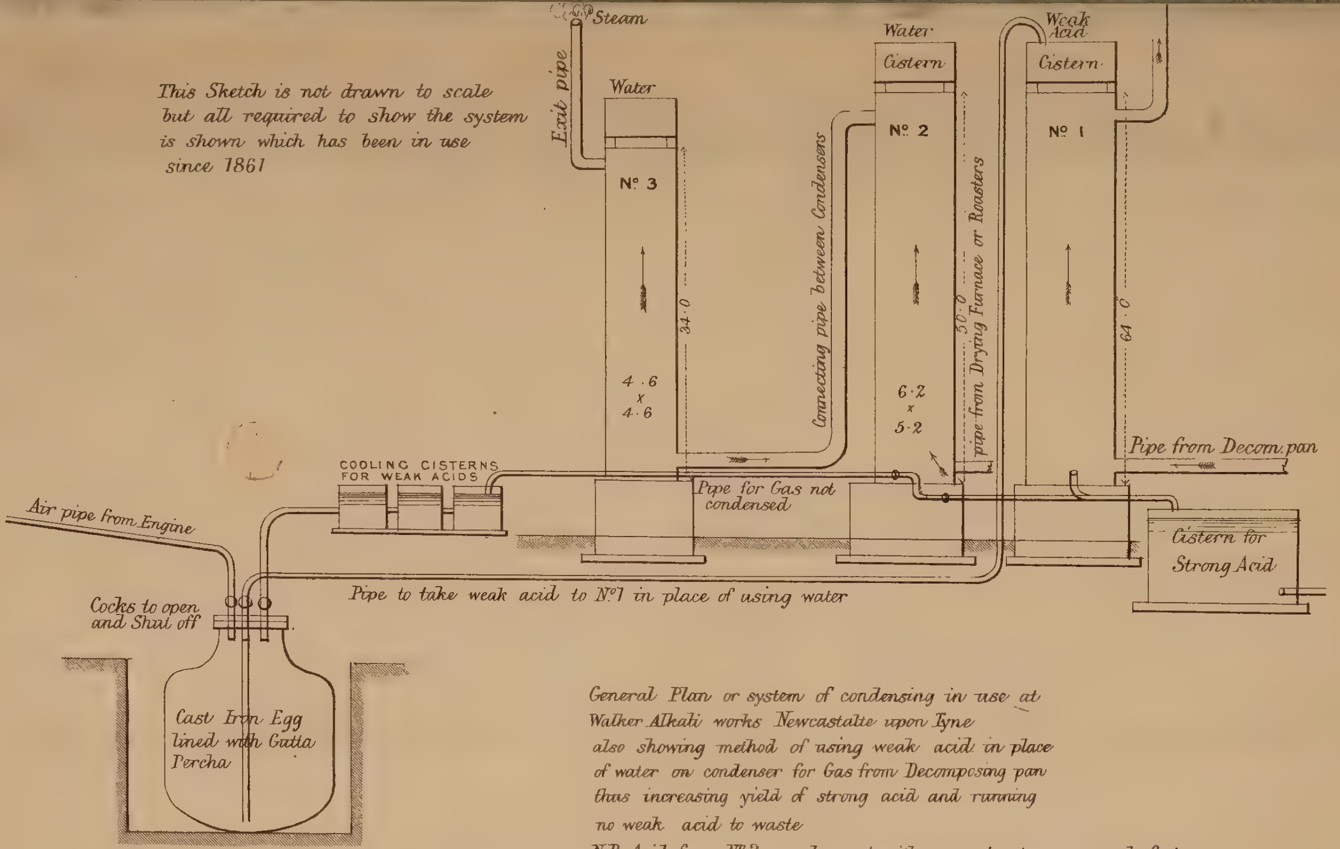
GATESHEAD.



ELEVATION OF NORTH & SOUTH.

ELEVATION OF EAST & WEST

J APPLEBY



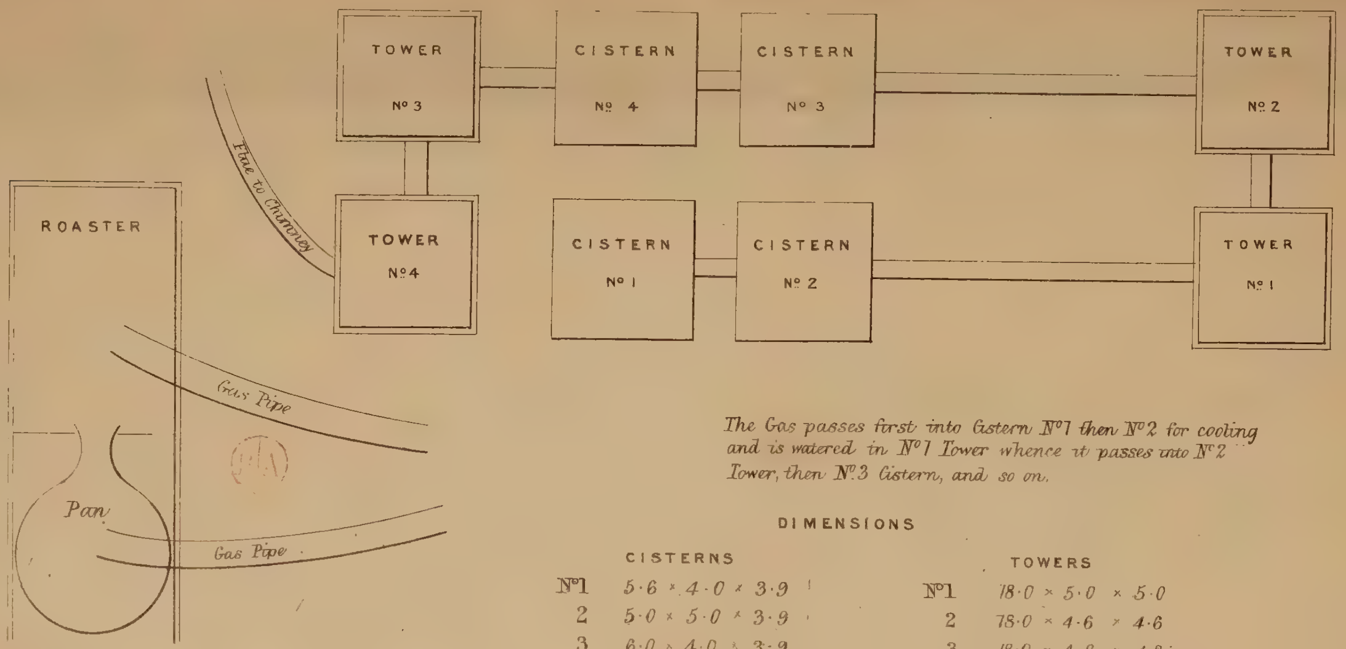
Steam
Exit pipe
Water
Nº 3
34·0
4·6
x
4·6
Connecting pipe between Condensers
Water
Cistern
Nº 2
6·2
x
5·2
50·0
pipe from Drying Furnace or Roasters
Weak Acid
Cistern
Nº 1
64·0
Pipe from Decom. pan
Pipe for Gas not condensed
COOLING CISTERNS FOR WEAK ACIDS
Air pipe from Engine
Cocks to open and Shut off
Pipe to take weak acid to Nº1 in place of using water
Cistern for Strong Acid
Cast Iron Egg lined with Gutta Percha

This Sketch is not drawn to scale
but all required to show the system
is shown which has been in use
since 1861

General Plan or system of condensing in use at
Walker Alkali works Newcastalte upon Tyne
also showing method of using weak acid in place
of water on condenser for Gas from Decomposing pan
thus increasing yield of strong acid and running
no weak acid to waste

N.B. Acid from Nº2 can be sent either way to strong or weak Cisterns

Day & Son (Limited) Lith.


TOWER
Nº 3
CISTERN
Nº 4
CISTERN
Nº 3
TOWER
Nº 2
TOWER
Nº 4
CISTERN
Nº 1
CISTERN
Nº 2
TOWER
Nº 1
ROASTER
Flue to Chimney
Gas Pipe
Pan
Gas Pipe

The Gas passes first into Cistern Nº1 then Nº2 for cooling and is watered in Nº1 Tower whence it passes into Nº2 Tower, then Nº3 Cistern, and so on.

DIMENSIONS

	CISTERNS		TOWERS
Nº1	5·6 × 4·0 × 3·9	Nº1	18·0 × 5·0 × 5·0
2	5·0 × 5·0 × 3·9	2	18·0 × 4·6 × 4·6
3	6·0 × 4·0 × 3·9	3	18·0 × 4·8 × 4·8
4	6·0 × 4·0 × 4·3	4	18·0 × 4·8 × 4·8

Pipes 6 fᵗ of 20 inch & 170 fᵗ of 12 inch

Plan of Condensing apparatus
at William Mᶜ Liesh's Works
Belfast

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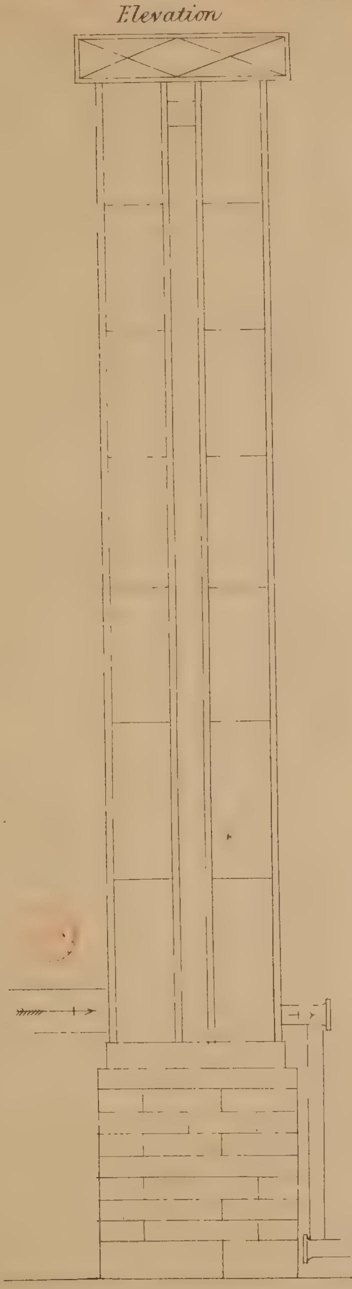
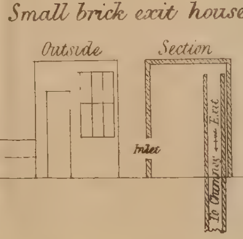
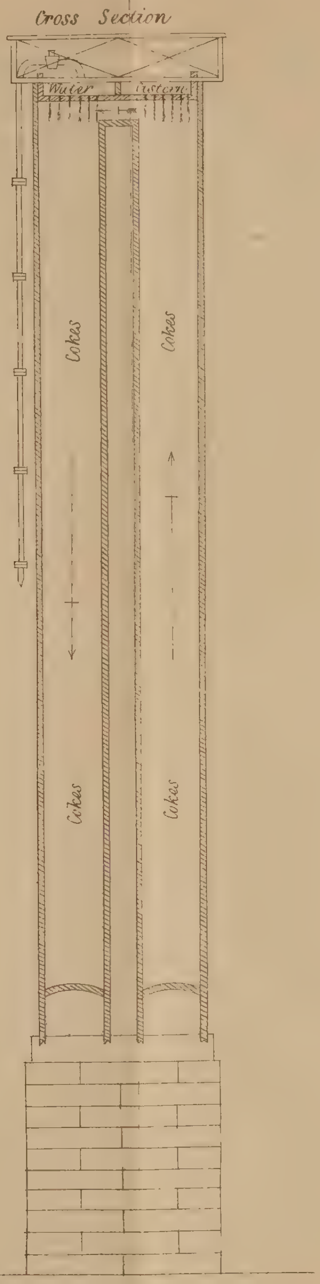
ROUGH OUTLINE VIEWS

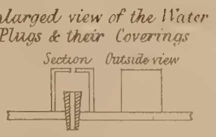
OF

MESSRS CHANCE'S CONDENSERS.




Small brick exit house
Outside
Section
Inlet
Exit
To Chimney


Cross Section
Water
Cistern
Cokes
Cokes
Cokes
Cokes


Enlarged view of the Water Plugs & their Coverings
Section
Outside view

a wooden Plug with hole thro' the centre.

b is a covering of earthenware which is nearly submerged thus closing entirely the top of the Tower when the water is admitted

c.c. bottom of water Cistern the water passes thro' the side of b.b. close to c.c. thus hermetically sealing the apertures The floor of the water cisterns at the top of each Tower is covered with the wooden Plugs as above & their Coverings

Scale 7/8 in: to a foot.

condenser gives more condensing surface in addition to more time for condensation. Water has been known to pour down in vigorous streams whilst the gas escaped in great strength. The water was scarcely acid to the taste, the gas excessively so.

A condenser with a very rapid draught would condense less than with a moderate draught.

We may believe it possible to make a condenser too large, but it would be difficult to make, or at least it is an evil that we are not afraid of meeting.

In a condenser which has too much water, the stream may be so great as to prevent the action of the coke, diminishing in reality the surface. If deep streams, as we may call them, run down they will present only their surface to the gas and the rest will be ineffective. Many and shallow streams are wanted. Condensers may of course have too little water. This was a common evil.

It would seem that when the stream of water meets the stream of gas going up the condensation is much better than when the water and gas come down together; for this reason to make a double condenser, or one divided into two parts, the gas going up one side and down another, is a mistake. The gas, when it goes up one side, may be led down by an earthenware tube to the bottom of the other side, up which it will go. It will, therefore, go up both sides instead of going up one side and down another. Changes to this system have been made with great advantage, see p. 25.

Gases condense better when cool. At some works there are long tubes to cool the gases before they pass into the condensers. At one works the gases entered so hot that the coke took fire. The previous cooling is becoming more usual and its advantage is obvious and great. Long cooling tubes diminish the necessity for the largest sized condensers. Sometimes large stone cisterns are used as coolers and gas is condensed in them. Sometimes both the cisterns and the long cooling tubes are used. In such cases the gas enters the tower under great advantages. I may mention Mr. Kurtz's works as an instance of this.

Sometimes a condenser is overworked; this is common, in other words we might say the condenser is too small, but it may be sufficiently large when the gas is allowed to pass at a uniform speed into the condenser; as an example, at one place 10 cwt. of salt were thrown into the pan once in two hours with imperfect condensation, but when 5 cwt. were used for the first hour and five for the second the condensation came within the Act. This mode of working was not so pleasant to the men as the intermediate rest was diminished.

The increased condensation obtained by causing the gas to pass upwards against the water, instead of downwards along with the water, is beautifully illustrated in Mr. Todd's letter referring to

Messrs. Burnett's works. Plate X. gives an elevation and section of the condensers; formerly there were no tubes or pipes connecting the two divisions; the gas went up one side of the tower and down the other; now it passes up one side, then by the tube it passes down to rise up on the other side of the tower, passing down again by tube to the chimney. The results as shown by Mr. Todd are very striking.

To condense properly it is quite necessary that there should be a draught through the condensers. The amount of air passing varies with the quality of the furnace. In some cases 1400 grains of muriatic acid are found to a cubic foot of atmospheric air over the pans, showing that vapour fills the space. In others the amount is as low as 4 or 5.

When the condensers are fully packed the passage of air is sometimes a good deal interrupted. To improve the draught Mr. Todd has advised, in several places with excellent result, that a shower of water should be passed down a perpendicular tube passing from the top of the condenser. The shower is in the perpendicular tube of Low Walker condenser. Plate XI.

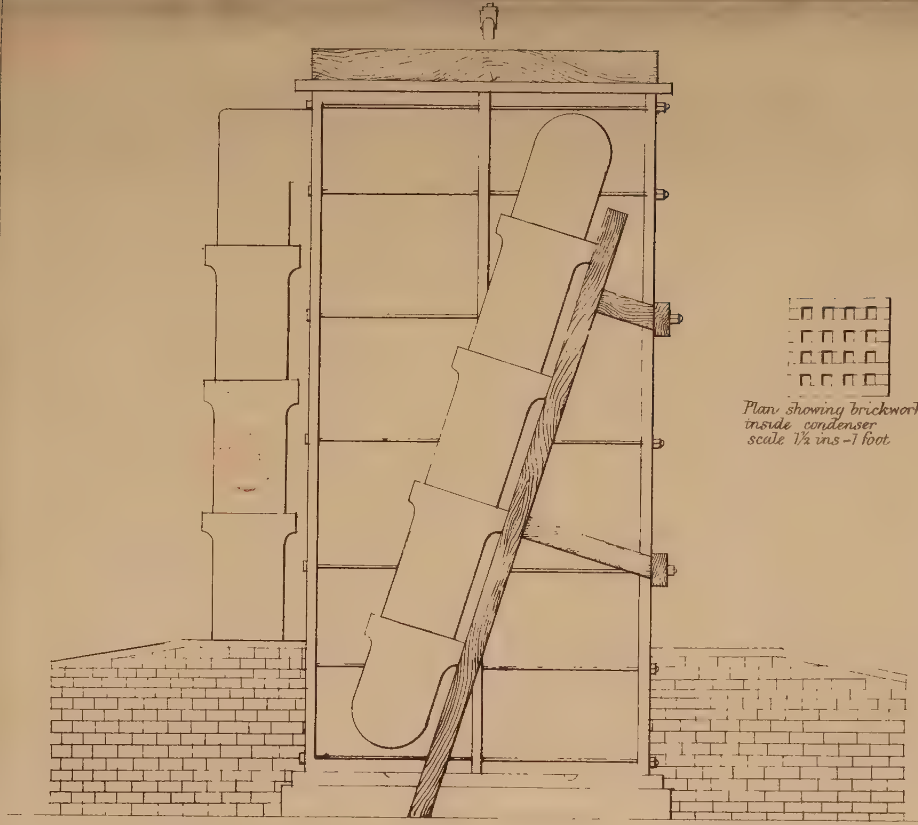
Mr. Brereton Todd's Letter on Condensers, Plate X. & XI.

Speaking of the defects of condensers and of the Low Walker Works, Mr. Brereton Todd says:

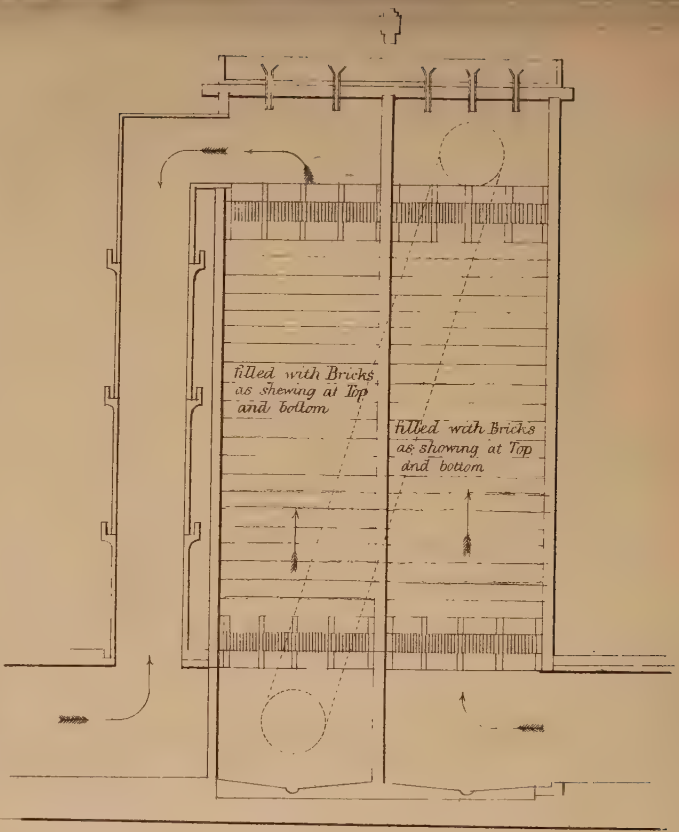
" When I first examined these works I found the condensation " very imperfect, with a great escape of muriatic acid, both from " the pan and the roaster condenser. Owing to the low situation " of the latter the gas arising from it was a constant cause of " complaint.

" The first alteration was the removal of the roaster condenser " so as to carry away the muriatic acid from the pan and roaster " in the same flue to the high condenser with the outlet on the " top, hitherto used only for the pan. Owing, however, to the " foundation having given way on one side it was greatly out of " the perpendicular, and therefore the water used for condensation " instead of being distributed over the area of the condenser fell " to one side, leaving the other almost dry. The condensation " was still, therefore, defective, allowing 20 per cent. of the " muriatic acid to escape by the outlet at the top, besides a large " escape of gas from the charging door of the roaster, caused by " the want of draught to carry it to the condenser. To do away " with these defects the condenser was repacked with coke and " the water distributed over the dry side by planks, as shown in " the vertical section. Pl. XI.

" The outlet on the top was done away with and a large pipe " placed as in the fig., down which a shower of water was made " to flow. This created an abundant draught, the pipe is seen " on the front elevation. By these alterations the escape from " the condensers was diminished from 20 per cent. to 3 per cent., " and a draught obtained which prevented all escape from the " roaster door.



Plan showing brickwork inside condenser scale 1½ ins-1 foot


filled with Bricks as shewing at Top and bottom
filled with Bricks as showing at Top and bottom

SCALE ½ INS-1 FOOT

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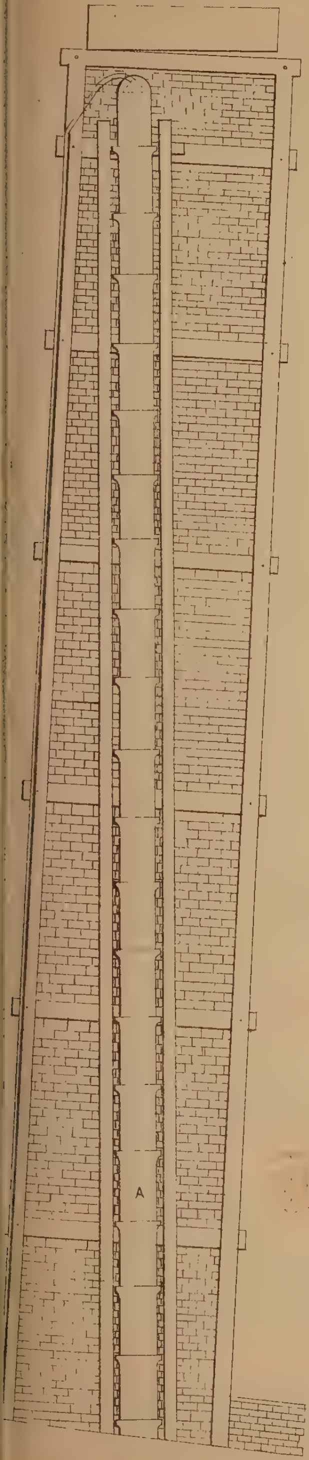
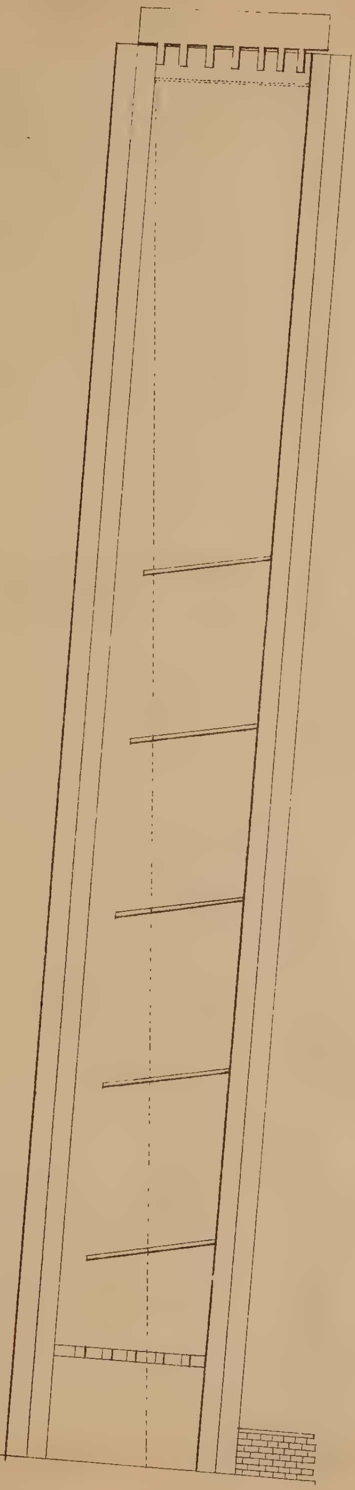
FRONT ELEVATION

Scale ¼ in's – 1 Foot



VERTICAL SECTION



" Messrs. Burnett & Sons, Bill Quay.

" When I tested these works first the escape was 20 per cent. " from the roasters, but now the escape is 10·7, making about 3 " per cent. on the whole. This shows the advantage of the gas " rising up against the water as the amount of condensing space " was not increased. The tube Pl. X shows the method of bring- " ing down the gas from one side of the condenser so as to send " it up on the other, instead of allowing it to go up one side " against the water and down one side with the water."

Since this was written the escape is much less than here stated.

Abridged Statistics of Condensing Space.

It is not the wish of the manufacturers that the full statistics obtained should be published, and the Act does not require it.

	Feet.
Greatest distance of pans from condensers } on the Tyne	610
„ „ furnace „ } on the Tyne	278
„ cooling space in pipes from pan, cubic feet -	597 c.f.
„ „ „ from furnace flues - - -	1776
The lowest amount of cooling space before entering the towers is (per cwt. of salt in 24 hours), cubic feet -	1·9 c.f.
The highest - - - - - -	70

This point deserves great attention.

If we exclude the great tanks at Mr. Harrison Blair's, the greatest amount of cooling space is 1756 cubic feet.

The highest number of towers is - - -	24
The highest towers are Mr. Allhusen's - - -	125
The widest towers, 8 feet 8 inches square.	
The greatest amount of condensing space, cubic feet -	32774
The greatest amount of condensing space for every cwt. of salt decomposed per hour is - - - -	120
The lowest was 4·8, it is now - - - -	8·4

Although the condensation is not on individual cases exactly as the size of the condensers, it is nearly so on the larger average.

—	Cubic feet to 1 cwt. of salt decomposed in 24 hours.	Per-centage condensation shown by amount of escape from condensers only.
Scotland & Ireland - -	37	0·103*
Midland & East Lancashire	27·5	1·21
West - - - -	22·5	0·221
East - - -	17·28	5·6 end of 1864.

The exception 1·21 is caused by one unusually large amount which existed at the time when this table was made.

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* The escape from condensers is given to illustrate the subject, but there is another escape in one or two instances from the decomposition of manganese salts, &c. which must be added to show the actual escape.

REGISTERED ALKALI MANUFACTURERS OF THE UNITED KINGDOM.

Thos. Adkins & Co.	Smethwick.
C. Allhusen & Sons	Newcastle.
J. & W. Allen	Do.
Frederick Allen	Bow Common.
William Barton & Co.	Leigh.
Richard Bealey & Son	Radcliffe.
H. Becker & Co.	Chadderton, Lancashire.
Harrison Blair, & Co.	Bolton.
W. H. Balmain & Co.	St. Helens.
Blaydon Chemical Co.	Blaydon, Newcastle.
Bonnington Chemical Works	Leith.
Thomas Bramwell & Co.	Newcastle.
Burnden Chemical Works	Bolton.
T. Burnett & Son. Bill Quay	Newcastle.
T. Burnett & Son. Dunston	Newcastle.
Henry Bury & Co.	Church, Lancashire.
Carville Chemical Co.	Newcastle.
Chance, Bros., & Co.	Oldbury.
Cook, Brothers	Newcastle.
John Cook	Newcastle.
Crosfield, Bros., & Co.	St. Helens.
Thomas Dentith	Manchester.
Evans & McBryde	St. Helens.
John Farmer	Gorton, Lancashire.
Thomas Farmer & Co.	Newington, London.
James C. Gamble & Son	St. Helens.
Garrett, John & Thomas	Wigan.
Gaskell, Deacon, & Co.	Widnes.
Hazlehurst & Son	Runcorn.
Hill & Sons	Liverpool.
Holland Bank Alkali Works	Church.
Alex. Hope, junr., & Co.	Glasgow.
William Howarth	Manchester.
John Hutchinson & Co. No. 1	Widnes.
John Hutchinson & Co. No. 2	Widnes.
Robert Imeary	Newcastle.
Jarrow Chemical Co., Friars Goose	Newcastle.
Jarrow Chemical Works	S. Shields.
Jarrow Hill Chemical Co.	near Newcastle.
Arnold Jones	Dublin.
William Joseph Kane & Son	Dublin.
Andrew George Kurtz	St. Helens.
Charles Lambert	Swansea.
Lea Brook Alkali Works	Wednesbury.
Thomas Lutwyche & Son	Liverpool.
Marsh Alkali Company	Swansea.
J. Marsh & Co. Parr	St. Helens.
J. Marsh & Co. Ravenshead	St. Helens.
Irvine & Bryce	Glasgow.

John Metcalf & Sons	Manchester.
McGeachy & McFarlane	Glasgow.
J. McKenny & Co.	Dublin.
John McLellan	Widnes.
William McLiesh	Belfast.
Solomon Mease & Co.	Newcastle.
Mersey Chemical Works	Widnes.
J. Montgomerie & Co.	Glasgow.
Morgan Mooney	Dublin.
Muspratt, Bros., & Huntley	Flint.
James Muspratt	Liverpool.
Frederick Muspratt	Widnes.
Netherfield Acid Works	Glasgow.
New Road Chemical Works	St. Helens.
H. L. Pattinson & Co.	Newcastle.
Richard Paxton	Middlesex.
Ebenezer Ridshaw Ridley	Newcastle.
John Riley	Hapton Church.
Runcorn Soap and Alkali Works	Runcorn.
Christopher James Schofield	Manchester.
James Shorthouse & Sons	Birmingham.
Richard Smith	Glasgow.
John Smith & Co.	Bolton.
Smith & Mawdsley	Flint.
St. Bede Chemical Works	S. Shields.
Stone & Webber	Bristol.
Charles Tennant & Co.	Glasgow.
Tennants & Co.	Manchester.
Walker Alkali Works	Newcastle.
Low Walker Chemical Co.	Newcastle.
Washington Chemical Works	Washington.
Weston Alkali Works, No. 1	Cheshire.
Do. do. do. No. 2	Do.
Edward Wilson	Prestolee, near Bolton.
George Whewell	Radcliffe.

SOME STATISTICS SHOWING THE GENERAL MAGNITUDE OF THE WORKS AND THE MODE OF WORKING.

(The numbers do not follow in the order of the names.)

Register Number.	Tons of Salt decomposed per week.	Number of decomposing pans at work.	Cwts. of Salt per charge.	Number of charges in 24 hours.	Cwts. of Salt decomposed in 24 hours.	Number of open Salt Cake Furnaces.	Number of close Salt Cake Furnaces.
1	67	2	8	14	224	0	2
2	6	1	10	2	20	0	1
3	18	1	7½	8	60	1	0
4	90	2	12	12	288	0	4
5	33	1	14	8	112	0	2
6	50	1	10½	16	168	0	2
7	220	7	7½	14	735	0	7

SOME STATISTICS SHOWING THE GENERAL MAGNITUDE, &c.—*cont.*

Register Number.	Tons of Salt decomposed per week.	Number of decomposing pans at work.	Cwts. of Salt per charge.	Number of charges in 24 hours.	Cwts. of Salt decomposed in 24 hours.	Number of open Salt Cake Furnaces.	Number of close Salt Cake Furnaces.
8	40	1	10	12	120	0	1
9	216	6	10	12	720	0	6
10	162	3	9	20	540	0	6
11	150	4	14½	8	464	1	3
12	108	3	12	10	360	0	6
13							
14	216	3	10	24	720	6	0
15	144	2	10	24	480	4	0
16	120	3			400	0	6
17							
18	250	5	10	16	800	0	10
19	50	1	10	16	160	0	1
20	100	2					
21							
22							
23	50	2	12	7	168	0	2
24							
25							
26	260	8	7½	14	840	8	8
27	35	1	9	13	117	0	1
28	60	2	10	20	200	0	2
30	27	1	9	10	90	0	1
31	12	1	7	6 in 12	42 in 12	1	0
32	63	2	6·25	36	225	2	0
33	27	1	7·5	12	90	0	1
34	21	1	6·25	12	75	0	1
35	150	6	9	60	540	0	6
39	57	2	11	16	176	0	2
40	68	2	7	32	224	2	0
41	21·5	1	6	12	72	0	1
42	14·5	1	8	6	48	0	1
43	54	2	10	18	180	0	2
45	26	1	11	8	88	0	1
46	18	1	7	8 in 12	56 in 12	1	0
47	5·5	1	6	3 in 12	18 in 12	1	0
49	125	3	7·25	56	406	3	0
50	115	2	8	48	384	4	0
51	310	5	8	120	960	5	0
52	6	1	5	4	20	0	1
53	36	1	5	24	120	1	0
54	115	3	6	72	432	3	0
55	43	1	6	24	144	0	1
56	116	3	5	72	360	3	0
57	36	1	5	24	121	1	0
58	86	2	6	48	288	2	0
59	36	1	5	24	120	1	0
60	36	1	5	24	120	1	0
61	36	1	5	24	120	1	0
62	340	5	10	120	1,200	5½	0

SOME STATISTICS SHOWING THE GENERAL MAGNITUDE, &c.—*cont.*

Register Number.	Tons of Salt decomposed per week.	Number of decomposing pans at work.	Cwts. of Salt per charge.	Number of charges in 24 hours.	Cwts. of Salt decomposed in 24 hours.	Number of open Salt Cake Furnaces.	Number of close Salt Cake Furnaces.
63	263	5	8	120	960	5	0
64	36	1	5½	22	121	1	0
65	36	1	5	24	120	1	0
66	36	1	5	24	120	1	0
67	240	6	6½	144	936	6	0
68	36	1	5	24	120	1	0
69							
70	86	2	6	48	288	2	0
71	70	2	6	40	242	2	0
72							
73	9	1	5	6	30	—	1
74							
75							
76							
77							
78							
79	403	14	6	16	1,344	—	16*
80	65	2	10	10	200	—	3†
81	10·5	1	5	7	35	—	1
82	10 or 12	1	6	6	36	—	1
83	130	4	10	10	400	—	5‡
84	15·6	1	8½	6	51	—	1
85							
86							
87							
88							
89							

When the works are standing for improvements, &c., or when the condensation is in Wolff's bottles and no roasters, the space is, for the present, left empty after the register number. There is no escape of muriatic acid as a rule, in such cases.

The total amount of salt used at the works which are described, is 5891·6 tons weekly. The calculations are made on 5,762 tons. The amount made is not rigidly the same every week and sometimes a larger number is taken.

THE MURIATIC ACID EVOLVED.

Properties.

When the muriatic acid was allowed to escape into the atmosphere without any attempt at condensation, it could be traced to a great distance; and as it destroyed vegetation wherever it fell, or wherever it was washed down by the rain, numberless complaints arose.

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* 14 at work. † 2 at work. ‡ 4 at work.

Hydrochloric or muriatic acid, to use Prof. Miller's words, "is " a colourless gas of a peculiar pungent odour, and an intensely " acid taste; it irritates the eyes, and if breathed when diluted " produces coughing. It is heavier than air and has a specific " gravity of 1·2474. 100 cubic inches weigh 39·64 grains." " 1,000 cubic centimetres weigh 1·63153 grammes" (Bunsen). This gas evolved into the air would occupy a space several hundred times greater than its original bulk in the salt and water from which it came, but as a pure gas it is never seen. It unites with the moisture of the atmosphere and of the coal smoke, and even when very dilute forms a dense white vapour. It is more inclined to fall than the smoke and is said for this reason to "leave a tail " behind it." If it escapes from a chimney in great quantities it may be seen moving to a great distance in remarkably straight lines always tending downwards; rain falling through it becomes acidulated. An experienced manufacturer informs me that even when there is an escape into the chimney of six per cent. of the acid evolved the effect is very decided to the eye. This is after mixing with an enormous quantity of smoke. If the vapour comes in contact with vegetation the leaves wither rapidly, and the acid may often be found by washing the leaves in distilled water. If driven against the lead of roofs it may cause a solution of chloride of lead; with 0·0031 per cent. in the air the smell is strong; some persons become accustomed to more than this amount, but generally it is found impossible to overcome the repulsion to the smell and the inclination to cough. It is, however, certain that some men keep excellent health breathing quantities which are intolerable to others, and others recover their appetites only in its presence. But the fact of any substance being in certain cases remedial is no proof of the absence of deleterious or unpleasant qualities. So in this case, none of those qualities which make it a favourite with a few men who are compelled to be in its neighbourhood invalidate the assertion of almost universal repulsion shown by most men, but especially by women and children, to the faintest odour of the gas, whilst plants seem to be still more sensitive.

Theoretic Spec. gravity 1261
liquefied by 40 atmospheres at 50 F. the liquid is of 1·27 sp. gr.
formed of hydrogen 2
chlorine 2

1 cubic inch of water absorbs 418 of gas at 69° Fahr., and becomes 1·34 cubic inches.

SPECIFIC GRAVITY and STRENGTH of SOLUTION.

E. Davy's Tables (Miller's Chemistry).

Specific Gravity.	Acid in 100 parts.	Specific Gravity.	Acid in 100 parts.
1·21	42·43	1·10	20·20
1·20	40·80	1·09	18·18
1·19	38·38	1·08	16·16
1·18	36·36	1·07	14·14
1·17	34·34	1·06	12·12
1·16	32·32	1·05	10·10
1·15	30·30	1·04	8·08
1·14	28·28	1·03	6·06
1·13	26·26	1·02	4·04
1·12	24·24	1·01	2·02
1·11	22·22	—	—

If we divide by 5, the fraction of the number showing the specific gravity, we obtain the specific gravity by Twaddell's hydrometer, and also the amount per cent., which two are the same nearly. Thus spec. gr. 1·210, if we divide 210 by 5 we have 42 sp. gr. 1·15, if we divide 150 by 5 we have 30.

The process may be reversed.

Mr. Kynaston gives the following useful tables:—

Amount of Muriatic Acid from a Ton of Salt of various Degrees of Purity.

1 ton of pure salt yields - - -	1397	lbs. of HCl.
1 ton, containing 99 per cent. of pure salt, yields	1383·6	„
„ 98 „ „	1369·6	„
„ 97 „ „	1355·6	„
„ 96 „ „	1341·7	„
„ 95 „ „	1327·7	„
„ 94 „ „	1313·7	„
„ 93 „ „	1299·7	„
„ 92 „ „	1285·8	„
„ 91 „ „	1271·8	„
„ 90 „ „	1257·8	„

Considering the impurities, the moisture, and the amount of salt left undecomposed, it is believed that 1,292 lbs. of HCl will be found to be the amount obtained generally from a ton.

The amount of acid is estimated generally by Twaddell's hydrometer. Mr. Kynaston recommends measuring it (see p. 55), and gives the following as the change of volume at various degrees of heat. (Chemical News, Vol. VIII.)

	1 cubic foot of liquid muriatic acid at	62°	Fahr.
becomes	1·0019 „ „	70°	„
	1·0043 „ „	80°	„
	1·0066 „ „	90°	„
	1·0089 „ „	100°	„
	1·0113 „ „	110°	„

	1 cubic foot of liquid muriatic acid at 62° Fahr.				
becomes	1·0137	,,	,,	120°	,,
	1·0161	,,	,,	130°	,,
	1·0184	,,	,,	140°	,,
	1·0208	,,	,,	150°	,,
	1·0231	,,	,,	160°	,,
	1·0255	,,	,,	170°	,,
	1·0279	,,	,,	180°	,,
	1·0302	,,	,,	190°	,,
	1·0326	,,	,,	200°	,,

These experiments are made on acid from 11 to 32 per cent. in strength, little difference being found between the results according to Mr. Kynaston. (Chemical News, vol. viii., 1863, p. 271.)

SENSITIVENESS OF SILVER SOLUTION TO MURIATIC ACID.

Solution shaken in a Vessel of fixed Size.

In order to find the extent of error which might be made in examining air containing muriatic acid, a close chamber of lead was used and in this a certain amount was evaporated rapidly. The objection to the lead or indeed to any surface is clear enough, but the method seemed the most convenient, and the experiment will at any rate be found of use. The silver solution was 50 c.c. containing 5 grammes of nitrate to 1000. ·863 HCl of 25 p. c. was evaporated and a bottle of 565 cub. cent. capacity was filled with the air of the chamber, and shaken with nitrate of silver; there was no re-action.

·4145	grammes HCl =	no re-action with silver.
·65	,,	ditto.
·863	,,	0·00269 per c. volume in the air of the room, with silver no re-action with 565 c.c.
1·00	,,	0·0031 0·0039 by weight—a weak re-action.
1·		0·0031 re-action.

In this last trial a litre bottle was used and a distinct cloudiness was observed; this may be taken as a limit.

Amount of Hydrochloric or Muriatic Acid evaporated at the following Temperatures and Specific Gravities.

Into a bottle was put muriatic acid of a certain strength. The air was drawn from the bottle and passed through a solution of silver. The air did not pass through the muriatic acid. The amount of muriatic acid in the air was estimated—

With acid of	1·15	the amount in air of	the bottle was	1·896	per cent.
,,	1·13	,,	,,	0·632	,,
,,	1·12	,,	,,	0·316	,,
,,	1·11	,,	,,	0·158	,,
,,	1·10	,,	,,	—	,,

No reaction was perceived in the last case when 86·4 cubic inches or 1415·7 cub. c. were used. The temperature was 66° Fahr. = 18·8. Cent.

Sensitiveness of a Silver Solution to the Vapour of Muriatic Acid when an Aspirator is used.

Muriatic acid was evaporated in the close chamber.

Grammes.		
0·091	of 25 per cent., giving air with No reaction with ¼ a cubic foot of air drawn through the silver solution.	0·0002821 per cent. of HCl.
0·2735	of 25 per cent. „ „ No reaction with ¼ cubic foot = 7079 cub. cent.	0·0008478 per cent. of HCl in the air.
0·8415	HCl - - - - No reaction with ¼ cubic foot.	0·002608 per cent. „
1·64	of 25 per cent. - - No reaction with ¼ cubic foot.	0·00508 „ „
4·072	of 24·09 per cent. - - With 375 cubic inches = 6,143 c.c., a slight action. With 750 cub. inches = 12,289 c.c., decided cloudiness.	0·0122 „ „

This latter amount contained 0·03767 grains = 0·002445 grammes.

Silver solution used 50 cubic cent. or 771 grains.

By shaking the gas well in a bottle of air containing 0·0031 p. c. of HCl. it was found to cause a re-action when 61 cub. in. (1000 c.c.) were used.

With the aspirator, 750 cub. in. = 12,289 c.c. are required to detect with certainty 0·012 per cent. This shows the first of these two methods to be 48 times more sensitive than the second; when there is less than 0·012 p. c. of muriatic acid in the air it may readily escape through the silver solution. By shaking the air and solution together this escape is prevented.

Air with Chlorides passed through a Solution.

Here the vapour of hydrochloric acid was united to ammonia, or in other words sal ammoniac was used, the atmosphere passed through 50 c.c. of silver solution as before.

1st. Amount evaporated.	Amount in the atmosphere p.c.
2 grammes.	0·0042 p.c.

a reaction on the silver was observed when 1000 c.c. of air had passed through.

2d. Evaporated.	Amount in the atmosphere HCl.
1 gramme.	0·002114 p. c.

required nearly 2000 c.c., showing a less delicacy than the first method but more than the preceding.

SENSE OF SMELL.—SENSITIVENESS TOWARDS MURIATIC ACID.

Muriatic acid was evaporated in a closed space and observations taken until the senses could perceive it.

1st HCl.	Vol. in the chamber.	Amount in one Vol. of inspired Air.	
0·1036 grammes 1·6 grains	0·00128	- - -	No smell.
2nd 0·1625 grammes 2·509 grains	0·00202	0·0000086 grms. 0·0001328 grs.	Slight smell.
3rd 0·2157 grammes 3·33 grains	0·00269	0·0000114 grms. 0·000176 grs.	Distinct smell.
4th 0·25 grammes 3·86 grains	0·0031	0·0000133 grms. 0·000205 grains	Strong smell.

For sensitive persons probably 2 of muriatic acid in 100,000 would be a strong smell, and perhaps even 1 in 100,000, but 3 may be taken as distinct for all persons.

Here with 262 cub. c. or 16 cub. in. of inspiration we perceive the smell strongly when 0·0031 p. c. is present.

A silver solution required 1,000 cub. c. or 61 inches of this air to shew a cloudiness. But in reality we can smell the acid with at least four cubic inches of inspiration, or 65 cub. cent. The accuracy of smell as compared with this method of using the silver test is as 4 to 61 inches, or 262 divided by 4 = 65 to 1,000 cubic centimetres, in other words one sniff of the acid is equal to a careful experiment with a litre bottle of 61 cub. inches. We must remember, however, that although the smell seems thoroughly to keep the ascendancy over the chemical experiment, the latter may in its turn entirely overcome the smell, viz., when we use a great excess of the air to be examined. We cannot accumulate sensations so very readily although it is no doubt true that we can to some extent. For example, a substance may not be offensive at first, but by repetition of the attack on the senses it may become extremely so.

GENERAL VIEW OF THE WORK OF THE INSPECTORS.

It will be seen from the list that the alkali works are confined to few districts, the greater number being near the Mersey and the Tyne. One very large work and several smaller ones are in Glasgow, and five in Ireland. Birmingham with neighbourhood has four, and Bristol and Swansea five. Others are building.

The situation of these works pointed to a division of the whole into four parts:—

No. 1. Western, includes Liverpool, St. Helens, Widnes, Runcorn, Flint, Bristol, and Swansea.

No. 2. Middle, East Lancashire, Staffordshire, and the South.
No. 3. Eastern, the Tyne and neighbourhood.
No. 4. Northern, Scotland and Ireland.

The division was made partly from geographical convenience and partly that a nearly equal number of works should be found in each. A sub-inspector or district inspector was appointed for each division. It was believed that not more than sixteen works could be inspected sufficiently by one person, and certainly at the first this was true, although it may not remain so. In one district there are 27 works.

The inspection demanded was of a kind entirely new; there was no well-recognized method of performing the work, and although we had succeeded very well in preliminary trials, many other plans were proposed, and the task of examining and deciding promised to be great; gradually, however, the process became simpler and the results produced confidence.

It has been observed that there are some persons who have become so skilled in the examination of the smoke from alkali works by the unaided eye that they can detect even 5 per cent. of muriatic acid gas in the mixture, and look upon 6 per cent. as giving very striking indications. This skill can be attained only by long experience, whilst the same appearances which prove the presence of 5 per cent. at one work do not strike our eyes when the same amount escapes at another work, so that the experience is not universally applicable. The reason of this lies in the difference of the height and draught of the chimneys, the quality of the coal, and also the arrangement of the flues; whether for example, black ash furnaces have a separate chimney or otherwise, and so on. When 5 p. c. is escaping it is not to be supposed that the smoke contains that amount calculated on its volume. That would be very much less.

There are various vapours arising from alkali works appearing to most persons very like muriatic acid. Sulphurous acid with some sulphuric acid may be sent out when copper smelting is joined to alkali making. When ammoniacal salts are made, muriate of ammonia sometimes appears in white clouds of a very dense kind, and even steam in certain mixture with smoke presents a problem not easily solved by the eye alone. In all alkali works, too, the white vapour from the black ash furnace is sometimes mistaken for acid although so extremely different in its properties.

Considering these things it was seen that inspection, meaning the mere act of looking in at an alkali work, would be utterly useless; a true inspection must include a series of chemical analyses of gases, and sometimes also of salts and acids. The Act of Parliament decides that a particular number, 95 per centum of condensation, or 5 per cent. of escape, shall be constantly kept in view. Sometimes the analyses for one alkali work can be performed in a day, sometimes more time is necessary, according to the number of furnaces and pans at work. In one case 34 determinations of gas are required. Such an establishment must be treated as several rather than as one. We might call every pan and furnace a single work, in which case the number is 170.

It was necessary at first to carry a certain amount of apparatus to every work when an inspection was required of a complete kind. By the great courtesy of the manufacturers this inconvenience has in some cases been entirely removed, as they have fitted up aspirators at the works, and occasionally in such abundance that one is found at every flue or opening to be examined. The apparatus has itself been modified, and after a time it may be reduced to the most trifling dimensions.

It is sometimes necessary to examine the sulphate of soda from the pan; this must be done at home, where it is needful to have a few tests and a balance, with some additional adjuncts of a small laboratory.

When condensation is complete the small apparatus which I have called the finger pump is enough, and the work is performed at once.

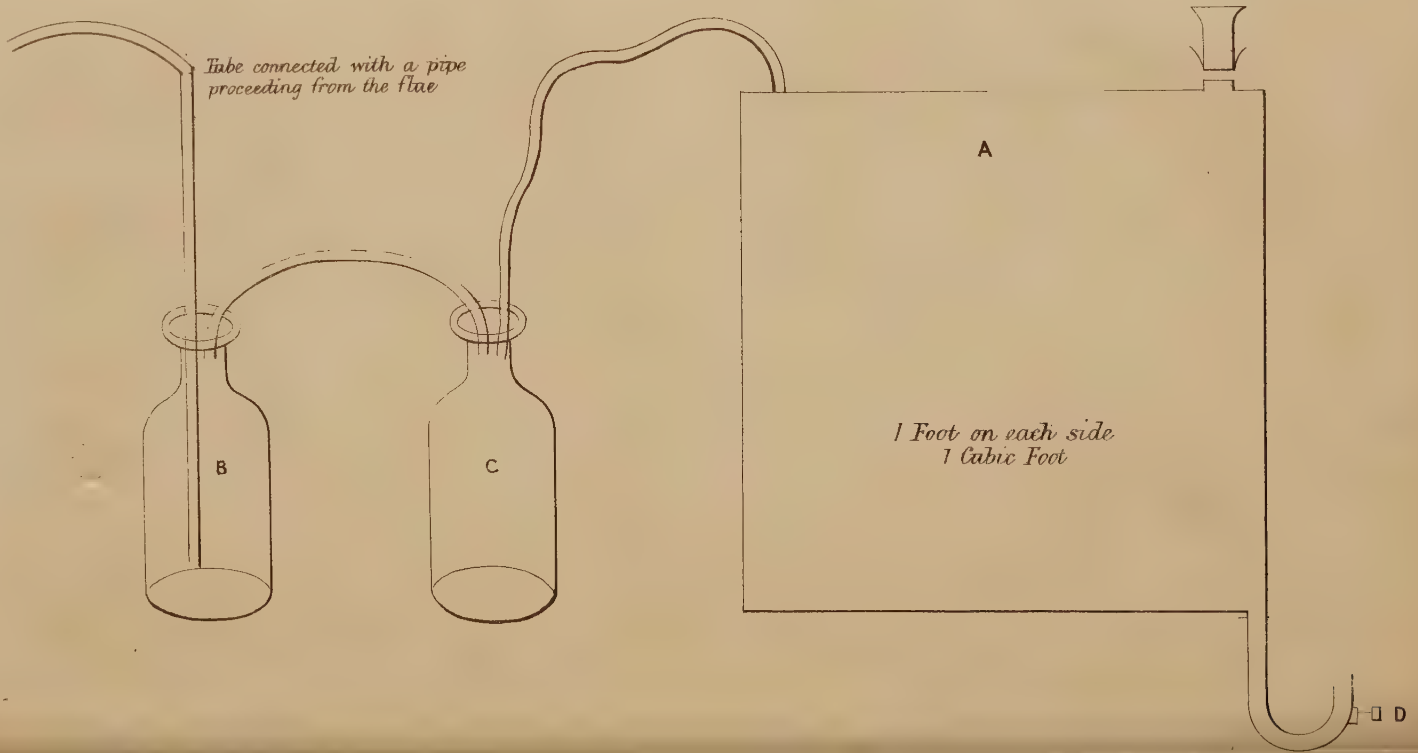
In some cases it is requisite to use self-acting fan apparatus to register in the absence of inspectors; such an apparatus will be described.

Act of testing at the Works.

The number of places at which the gas is tested at any work varies, not merely with the size but the plan of the work. At some places every pan and roaster form together a distinct piece of apparatus, and at others they form two. Other varieties will be seen under *arrangements.*

If there be several inlets to a condenser, each must be tested, and an average taken; there is generally only one outlet to each; at one work there are 34 estimations of the muriatic acid to be made before it can be said with certainty that the work is conducted properly. Let us, for example, take No. 3 district; the number of testings as seen at p. 54 are 139.

In making the arrangements for the inspection it seemed to me that it would be needful to spend a whole day on each work, including the journey to and fro. I am not yet able to say whether on an average this time is demanded; some journeys are very long; on the other hand, some works have condensed so much better than was expected that the trouble of examining is reduced to a very trifling amount. The alkali makers themselves seem surprised at the ease with which they have succeeded. If the condensation is not perfect, although as complete as the Act requires, and this is the most common case, the examination often made in mud and rain is a matter requiring a good deal of patience; however, I am inclined to think that time will diminish the difficulty in all cases, as it has already done in many, and as the second year will bring easier duties, perhaps also it will see them better performed. We cannot well judge by the first year, which has required the organization of a system of inquiry.


Tube connected with a pipe proceeding from the flue
A
1 Foot on each side
1 Cubic Foot
B
C
D

There has been no generally recognized method of ascertaining the per-centage of muriatic acid escaping from any manufacture of soda, but there was the method used by Mr. Gossage and which he communicated to me. Mr. Wm. Gossage estimates the amount of acid in a cubic foot of the gas entering the condenser, and the amount in a cubic foot of the gas coming from the condenser. It would be more correct to say the amount passing along with a cubic foot of air. The relation of these two quantities will give the per-centage of escape; Mr. Herbert Gossage explains it thus: "I was working with Mr. Shanks at the time when Dr. " Brett used to test the gases passing from the condensers. I " have seen this done frequently and have repeated the operations " many times. The condensation was so perfect that nitrate of " silver solution remained quite clear. I would propose to use " ammonia in place of nitrate of silver for absorbing the HCl, " and I would then make up the solution obtained to say 1,000 " septems. I would then test an aliquot part of this solution " with graduated solution of nitrate of silver upon your old " system of volumetric analysis (writing to Mr. William Gossage).

He then prepares a solution of common salt, of which 100 grains are equal to $\frac{1}{100}$ of a cubic foot of HCl, or contain the same amount of Cl.

" Let us now provide an aspirator A shown in sketch pl. XII., " consisting of a lead vessel capable of containing one cubic foot, " and having an opening for filling and a curved pipe for running " off water. Also two flasks, one of which B shall contain half " an ounce of strong liquid ammonia coloured with litmus. The " vessel A being filled with water, the apparatus arranged as " shown in sketch, and the connecting pipe introduced into the " flue, and well secured with clay at the point of introduction " to prevent access of atmospheric air; the cock D should then " be opened, when the descending column of water will draw " gases through the two flasks from the flue.

" The flask B will contain an atmosphere of ammonia which " will seize on the HCl and the resulting mixture will bubble " through the water in flask C, during which the chloride of " ammonium will become arrested.

" When the whole of the water has escaped from the vessel " A, this will contain one cubic foot of non-condensible gas abstracted from the flue, and the condensible gas previously " mixed with it will be found in the two flasks in solution " combined with ammonia.

" Empty the two flasks into a deci-gallon measure (100 " septems), wash with distilled water and make up the quantity " to 1,000 grains, but having previously added NO_5 to make an " acid solution. The 1,000 grains of solution will contain the " HCl previously mixed with one cubic foot of residual incondensible gas drawn from the flue into the vessel A, or 100 " grains of this will be equivalent to $\frac{1}{10}$ of a cubic foot of such " gas. Let this quantity of 100 grains be now tested with the

" standard solution of AgO NO_5 of which 100 grains = 0·01 " cubic foot of HCl; and supposing it to require 200 grains to " combine with all the Cl this will represent 0·02 cubic foot of " HCl which × by 10 is equal to 0·2 cubic foot as having been " mixed with the one cubic foot of residual gas in vessel A.

" We may suppose this trial to have been made with gas taken " from the flue leading *to* the condenser, and if a similar trial " made with gas taken *at the same time from* the flue leading " *from* the condenser should have taken 10 grains of AgO solu- " tion, this would represent the presence of 0·01 cubic foot of " HCl previously mixed with the one cubic foot of residual gas " on $\frac{1}{20}$ of the quantity contained in the gas of the inlet flue, " which is in the ratio of 95 °/₀ condensed and 5 °/₀ escaping " condensation."

The testing of works such as No. 1 is performed in two operations for every pan. If the pan is near the condenser the gases may be very warm and the absorbing solutions might be expected to be heated, but as a rule they are not even perceptibly heated, and the gases pass into the aspirators at the temperature of the water used. There is, therefore, no necessity for making any allowance for temperature.

The gases are obtained generally by boring through the earthenware pipe, which constitutes in most cases the flue, an operation readily performed by some one on the premises. The tube connected with the aspirator is inserted, and around it is put some clay to prevent common air from rushing into the opening. This clay is generally found on the works. In some places it is called barytes; it is a pity to find words with such a perversity of meaning, but this confusion of terms is common in chemical works.

The process of decomposition of common salt lasts from one hour to four hours. To enable us, therefore, to know on an average the amount escaping, it is necessary to examine the gas, either by causing it to pass through a solution at an equal speed during the whole time, or by causing it to pass at various periods of the time named and taking an average. The mode of doing this was at first considered one of the greatest difficulties, but it is now assuming another aspect. It is found in some works that the greatest amount of gas is evolved when the sulphuric acid has been added to the salt about 20 minutes, but this is not invariably the case, and care must be taken not to trust to this number of minutes. If the condensation is good when the greatest amount escapes it is good at all other periods. The actual amount escaping from condensers generally does not vary exceedingly during the time of the process. At Mr. Hutchinson's the amount is always the same, as the hours are so divided that a fresh charge is made at regular intervals, so that the whole examination may be made at any time. But on this point some further experiments are required. The following may be inserted.

The moment of greatest evolution of gas :—This will vary with the plan of working. Here is a three hours charge examined :—

Times.	Grains of HCl per cubic foot in exit gas.	Times.	Grains of HCl per cubic foot in exit gas.
after 1 50 m.	1·13	after 3 30 m.	2·08
* 2 10	2·08	3 20	
† 2 22	1·92	‡ 3 45	2·77
2 40		‡ 4 0	2·08
2 45	4·16	4 15	1·08
3 0	3·57	4 30	1·13
3 15	3·13	4 40	1·13

It is only in some cases that the examination can be conducted during the whole of a charge. If a pan is entirely separated from the roaster this may be done. If the two unite, then the roasting will interfere, as it does not cease when the pan gas ceases. Then too, perfect examination requires that the amount of air passing along the two flues should be estimated.

If the inlets and outlets are examined together during the whole of a charge, the examination of the condensation at large works becomes a matter of days and practically useless as the eye is fixed on one particular spot only. After long consideration of this point I have entirely given up trusting to such a method. We must have ready and rapid plans. I trust, therefore, to numerous and short observations, some taken at the beginning, some at the middle, and some at the end of a charge, and if the average is right, we must consider that there is a compliance with the Act. On this point experiments are making, but are not ready for publication. We decided then to ascertain simply, that the furnace or pan was at work, ascertaining the amount condensed, varying the time occasionally. So far as I know, there is no case where any condensation is called sufficient unless it was so at any time whatever. In the coming year the illustration of this will be made more complete.

The examination of perfect condensers is a very easy task. A journey must be made, it may require an hour or a day, when the work is reached the testings may be two or 32. If two only, and the apparatus is kept ready at the works and the charge is in a proper condition, the experiments may be made in an hour, or even much less, but it may happen that the charge is nearly finished, and we must wait for the proper time. For this reason a small work may take as much time as one very much larger. The time will probably come when an actual experiment will be unnecessary, as by simply putting a glass tube into the flue and drawing into the mouth a little vapour we learn to make a remarkably fine analysis, and with certainty to say if there is any reason for examining further. I have frequently examined in this way before the experiments were made with silver solutions, and obtained very accurate results, as convincing to me as any experiments, although the law may demand more on certain occasions.

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* The charge in the furnace. † Stirring the charge and letting in air.
‡ Charge drawn from the furnace between these trials—pan still continuing.

This kind of examination I do not advise at present, although looking to a mode by which our work may be made simple, not merely for ourselves but on account of the public, as I cannot shut my eyes to the fact that inspection of this class is upon its trial before the country, and if it becomes both easy and efficient it may become also more general and more useful. For this as well as for those reasons given above I have attempted to simplify and shorten the experiments. Without short and rapid methods legal evidence of a nuisance has proved almost an impossibility.

No. 2 arrangement, p. 18, is tested as No. 1, the number of testings being irregular.

The acid may be estimated by weighing the precipitate of chloride of silver, or by Gay Lussac's method. Those who are not inclined to estimate silver by the use of a solution of common salt, or in any volumetric way, must take the precipitates home and weigh them on a balance.

If the chimney gases are to be examined the amount of chlorine being so small a very long time must be given for aspiration. This will hereafter in some cases be done by the use of Mr. Fletcher's fan aspirator.

If works 4 or 5 are to be tested, the open condensers being separate from the pans, it will be found that all or nearly all the gas escapes from the roaster condenser.

On the amount which enters the condenser the escape may be 12 per cent.

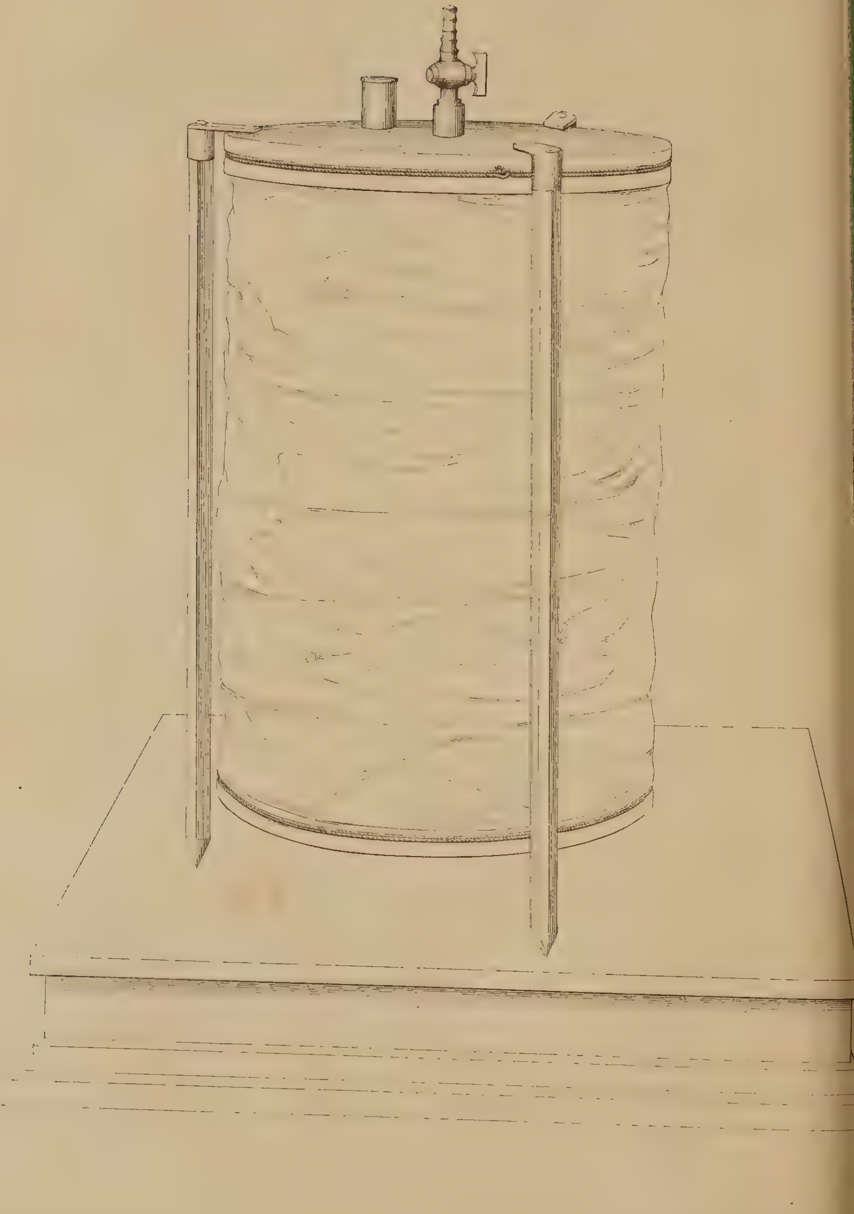
Let us suppose that none escapes from the pan condenser, then the 12 per cent. must be calculated on the whole amount. To ascertain this it is needful to take home specimens of the sulphate of soda from the pan. If 25 per cent. only of the muriatic acid is found there, then the 12 per cent. must be divided by 4, giving 3 per cent. of escape. If 33 per cent. is found the amount will be 4 per cent. escape.

It is of course necessary to calculate the per-centage on the total evolution of gas and not on the amount entering any particular condenser. The manufacturer is at liberty to separate the portions of the gas to be condensed as he pleases, that is, to condense a part in one condenser and the rest in another, but the inspector must unite them in his calculation.

Apparatus for Testing.

The use of heavy aspirators is inconvenient, especially when a visit is to be paid to works not easily accessible and near

PL.



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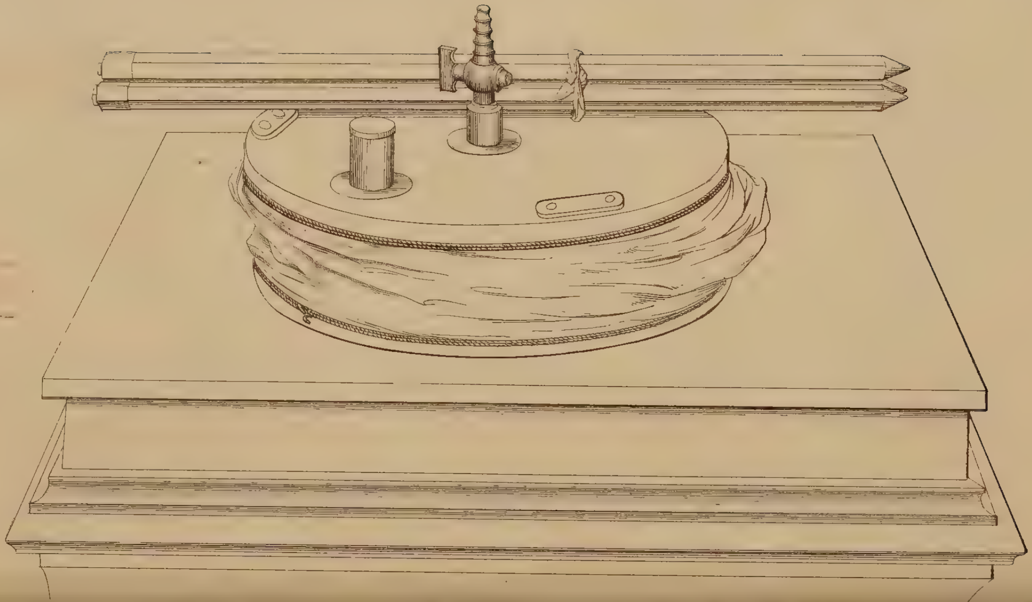
PL. XIII A.



railway stations where no cabs are to be found; but it has been mentioned that the great courtesy of the owners and managers of the works has, in most cases, removed the difficulty, as standing apparatus has been supplied, and it is only requisite to take to the works solutions of known strength.

Not knowing that such a convenient arrangement would be made, the question of aspirators became at first the most important. A box of a cubic foot in magnitude is much more bulky than one would imagine, and if filled with water is extremely heavy; it requires also more time to fill it than was considered desirable. It was supposed that it would be requisite to make the examination at once on entering a work; for this reason Mr. Fletcher had an aspirator made with a six-inch opening, so as to be filled rapidly. This could also be used as a box in which the rest of the apparatus could be packed. It was made of tinned iron and japanned; there was a glass tube outside to show the height of the water. A box like this is of course apt to be changed in size by various accidents.

Dr. Hobson diminished the bulk by making the aspirator to hold 1200 cubic inches only; it was of firm copper so that it might be less liable to be dinged, every inch of height was equal to 100 cubic inches as the area was 10 inches square. The opening for the water was about 1½ inch in diameter, and by a large funnel it might be filled rapidly. The whole was packed in a leather case. From the general use of aspirators in works it is now scarcely required.

Thinking that the water aspirators might be inconvenient I provided my colleagues with flexible aspirators, an instrument which I have used with advantage for some time. There are several forms, here is one; it is a bag of a cylindrical form stretched out with hoops at intervals, Plate XIII. There is a wide opening through which the air can be rapidly passed so as to empty the aspirator; in this case it collapses and takes the form on Plate XIIIa. A weight is attached to the bottom so that it may draw sufficiently, but the speed is regulated by the tap at the entrance tube. It can be made to draw the gas at the rate of one bubble in some seconds, or in a rapid stream which flows constantly and regularly. The amount of gas may also be measured with considerable and as a rule with abundant accuracy. It has only one fault, the flexible material, which is caoutchouc cloth, is apt after awhile to become imperfectly tight.

Mr. Dancer, optician, Manchester, then made the following instrument, which may be called the swivel aspirator.

Two jars graduated into parts of a cubic foot, or according to pleasure, are mounted in brass, and placed mouth to mouth on an axis *g*, *h*, or the white portion enclosed by *c*, *d*, *e*, *f*, Plate XIV. The upper jar is filled with water and the taps opened, then the water flows from *a*, to *b*, the air or gas entering by *h*, and passing previously through any solution that may be used, as at *i*. The gas enters *a* by the tube *k*, the air in *b* goes out by *c*. When *a* is emptied it is simply turned round by the hand, and *b*, the filled bottle, stands uppermost.

The shaded part of *c*, *d*, *e*, *f*, revolves with the jars, and the openings are so made as to form continuations of the openings in the axis *g*, *h*. The same conditions exist no matter which jar is uppermost. This apparatus is very convenient in a laboratory, and has an advantage over most aspirators in measuring the gas. The measurements on the jars are made at a definite pressure of water, and this ought of course to be maintained when the numbers are read off. The apparatus is certainly very elegant, and is an ornamental as well as useful addition to a chemist's work table.

This apparatus was a re-invention: Drs. Boswell, Reid, and Brunner had both used double aspirators, and Boisgiraud had put it into the form here given by Mr. Dancer, I am told.

The use of the swivel apparatus removed much of the difficulty of carriage, as it was not heavy and could be taken from one part of the works to another readily. It was kept always filled with water and caused no delay. Measurements could also be made of small volumes as the whole contained only one-twentieth, or, as with the smaller size, one-fortieth of a cubic foot, whilst this was divided, as seen in the figure, into parts = $\frac{1}{1000}$ of a cubic foot. A whole or $\frac{1}{1000}$ part of a cubic foot of gas could be taken at pleasure.

By these aspirators the air is drawn through solutions and the amount of muriatic acid ascertained.

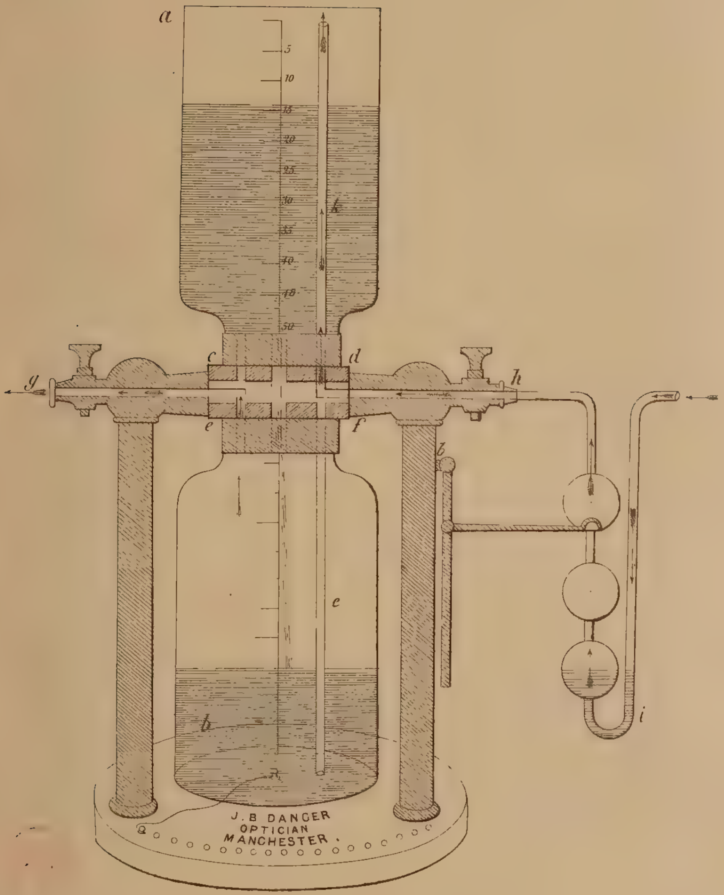
In using aspirators we may employ two, three, or four bottles of silver solution. If the operation is conducted very rapidly, say one foot in 20 minutes, three or four bottles may be used, the fourth will seldom show the slightest chloride of silver. If allowed to run off in 40 minutes or more there will be none in the third bottle.

Ammonia may be used, as Mr. Gossage recommends, along with the silver; there is an advantage gained, as will be seen from the experiments on sensitiveness, but it is so extremely small that it never can affect the questions raised by the Alkali Act.

Method of testing with an Alkaline Solution.

If we could tell the moment of saturation of a very weak silver solution with hydrochloric acid we should require no after measurements. It would be needful only to find how much gas at the entrance was needful to saturate, say 100 grains of solution, and how much gas at the exit for the same amount. By an inverse proportion we should then have the per-centage condensed. The whole experiment along with the calculation would then be performed in one operation, the per-centage would in reality be read off, but experience had not shown that the point of saturation of the silver could be observed during the aspiration. The sulphurous acid requires us to use a very acid solution of silver. An alkaline solution of soda tinctured with litmus was therefore tried. This

PL. XIV.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J. B DANCER
OPTICIAN
MANCHESTER.

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solution remains blue whilst the muriatic acid is passing through it, until the soda is saturated, we then see it change to red. By this means we require only to find the ratio between the amount of acid required to redden at the inlet and at the outlet of the condensers.

Suppose a solution to contain 0·1 of soda, the gas at the inlet = 10 divisions of the apparatus, equal to $\frac{1}{100}$ of a foot, may be supposed sufficient to redden a given quantity, let us say 1000 grains of solution. At the outlet we find 100 divisions necessary to redden the same amount; the amount of gas will be ten times more in one than in the other. In the first there will be 11·8 grains of HCl in a cubic foot, in the second 1·18, or 10 per cent.

By this method all the acid is viewed as hydrochloric.

It will be seen, however, that the gases from the condenser contain sulphurous acid (and even a little sulphuric acid, according to Mr. Fletcher), this method is therefore rather too severe on the makers of alkali as it treats all the acid as if it were muriatic. At the same time it is clear that if any process stands this test it will be found still more free from blame by the nitrate of silver test. This test is not sufficient to convict anyone of infringing, but it is sufficient to show in most cases that works are conducted in perfect accordance with the Alkali Act. When the escape is greater than five per cent. it is needful either to try with silver, or with permanganate of potash, or any agent which will detect sulphurous acid. The amount of sulphur acids must be subtracted from the total acid. But it is to be expected that there will never occur any disputes on points so small as the difference between five per cent. and six per cent. When these numbers are reached it becomes so easy to diminish them that all the manufacturers are inclined to take this course.

The operation with the coloured alkali solution is so simple that it is much to be recommended; all persons can see the point of saturation as the colour changes. Every one also can make the calculation, indeed the instrument performs this for them, and a knowledge of chemical formulæ is unnecessary. It is not even necessary to know the strength of the soda solution, as it is the proportion which is wanted and not the actual weight.

When the coloured alkaline solution is used it is necessary to have it in one vessel only; a Bunsen's tube 15 in. long slightly raised on one side so as not to be entirely horizontal is found most convenient. Bottles could of course be employed and the solutions mixed and tried afterwards, but the advantage of fixing on the point of saturation during the passage of the gas would be lost.

Solution used by Dr. Hobson.

Another method has been adopted occasionally by Dr. Hobson. The gas is passed through distilled water, two bottles being used. It has been found that at outlets where there is little muriatic acid there is none found in the third bottle, where a silver salt is used to arrest it. The solutions in the two bottles are mixed and divided into two or more parts. One is tested with soda; this gives the total acidity. The other is tested with permanganate of potash; this gives the amount of sulphurous acid, which is subtracted from the total acid, the remainder is the muriatic acid. This very simple plan is also very inexpensive in silver salts, and gives the amount of two acids instead of one (although with the sulphur acids we have no right to interfere).

Experiments of Mr. Glover and Mr. Balmain.

At Wallsend Mr. Glover has made an aspirator containing several cubic feet of water; it works for 24 or more hours, and he is in reality continually testing the amount of his condensation. At St. Helens Mr. Balmain fixed an aspirator made of a large iron cylinder in his laboratory, and by its means passed the gas from his chimney through a silver solution for many months. The amount of gas was very small and was quite absorbed by the iron tube through which it passed. The whole amount of muriatic acid passed during many months was scarcely perceptible, but it proved the use of iron tubes to be a failure. A similar case occurred at Wallsend where lead was used, the gas was absorbed by the lead; probably this would not long continue to be the case, but it was considered uncertain and a gutta percha tube substituted. Even with gutta percha or caoutchouc, the whole of the acid is condensed on the sides for a short time at first, so that the succeeding operations are the safest. The first may be rejected. Tubes ought to be as short as possible. When using long tubes, where short ones cannot perform the work, great care must be taken lest the manufacturer should be treated with more leniency than justice. But this is merely saying that here, as in all chemical experiments, the work must be done with watchfulness and not merely by routine.

Method by measuring the Current.

Although different aspirators have been spoken of, the method of ascertaining the per-centage has in every case described been on the principle explained by Mr. Gossage, the relation between the entering and escaping gases being determined by direct measurement. It is, however, not quite necessary to estimate the gases entering; we know the amount as it can be calculated from the quantity of salt employed in a charge. If, for example, 1,000 lbs. of salt are used the evolution of muriatic acid gas will be 623·9 lbs. If the whole is driven of in one hour it will be equal to 10·39 lbs. in a minute.

If the escaping gas contains 1·0 grain of muriatic acid per cubic foot and 10 feet per second are escaping, we have 10 grains per second, or 36,000 per hour, equal to 5·14 lbs. of muriatic acid gas. This is equal to 0·82 per cent. of escape, and a case not unlike such as actually occur.

I was inclined to adopt this method to the exclusion of the former, but the preliminary inquiries are not completed.

Many experiments of this kind have been made expressly by Dr. Hobson, who prefers the plan; after some time it may be found so convenient and accurate that the other may be entirely discarded. The following trial was made to ascertain how closely the amount of acid per cubic foot, in the gas entering the condensing towers, agreed with that obtained by calculation, using the syphon guage to indicate the amount of gas passing along the flue.

For this purpose a work was chosen in which the gases from the pot and furnace or roaster joined before entering the condensing towers, and in which the charge was 7 cwts. of salt per hour, and the draught in the flue, by the syphon gauge, 0·25 inches of water, equal to 10·49 feet per second.

The amount of acid per cubic foot by calculation, and the method of calculating is as follows:— 10·49 the number of feet passing per second, multiplied by 3,600, the number of seconds per hour, gives 37,864 as the number of feet passing along the flue during the charge; as the flue is 2 feet square it is only necessary to multiply the numbers of feet per hour, by 4, to obtain the number of cubic feet passing during that time, this gives 151,456. Now 7 cwt. of salt, deducting 10 per cent. for moisture and impurities, contains 3,082,100 grains of muriatic acid gas, which, divided by 151,456 the number of cubic feet passing during the time of its decomposition, gives 20·35 as the number of grains of acid contained in each cubic foot of the inlet gas.

The amount by experiment is as follows:

	Inlet gas. per cub. foot.	Exit gas. per cub. foot.
5 minutes after charging	9·60	0·72*
15 " "	67·20	0·18
25 " "	10·80	0·18
35 " "	7·20	0·06
45 " "	7·20	0·06
55 " "	7·20	0·06
Mean	18·20	0·21

This number 18·20 obtained by experiment agrees very well with that obtained by calculation 20·35, and a better mode of taking the average will make the agreement closer; if we take the same amount passing at the exit for the two calculations, we shall find the per-centage quantity escaping nearly the same.

	Inlet gas. per cub. foot.	Exit gas. per cub foot.	Percentage escaping.
By experiment	18·20	0·21	1·15
By calculating the amount at inlet.	20·35	0·21	1·03

The difference between the two is only 0·13 per cent.

It is intended to examine this method much more fully, it will very much simplify the inspection of works generally. The only reason for any delay lies in the method of measuring the draught exactly; several plans have been proposed but all have not been tried by experiment. The water-gauge of the shape of a U tube has been employed with very satisfactory results. Another gauge with spirit in it instead of water and with a horizontal tube of small bore in which exists a bubble of air, magnifies the movements of the water-gauge by 25. It is by Dr. List of Hagen—see Dingler's Polytechn. Journ. 1864. As the liquid rises the bubble in the horizontal tube is drawn forwards, and as this tube is much smaller than the upright tube a corresponding amount of space must be traversed by the bubble. The increased delicacy, however, was in reality not found necessary, the water-gauge being sufficiently correct for most purposes. For example, if we made an error of observation of a whole tenth of an inch we should find that the result would rarely be a grave one, and such a mistake is far too large to imagine. Let us suppose the gas escaping contained a certain amount of muriatic acid which shall be the same at each of the following pressures, viz., 0·2 grains per cubic foot:

---

* Probably the water on the condenser was insufficient at the beginning.

0·1	in pressure will give	an escape of	0·93 per cent. muriatic acid.
0·15	"	"	1·138
0·2	"	"	1·315
0·25	"	"	1·469
0·3	"	"	1·61
0·4	"	"	1·86
0·5	"	"	2·07

The table giving speed and pressure in flues was taken from W. R. Johnson's report on American coal, and was found by experiment to be very correct; the above calculations were made from it. The subject requires further examination.

As an instance of these variations, although perhaps we must call some of them rather improvements, let us compare the numbers indicating the per centage of muriatic acid escaping during the four latter months of 1864 in eight works.

AMOUNT per cent. of MURIATIC ACID escaping.

September.	October.	November.	December.	Mean.
4·31	4·73	4·95	4·55	4·32
3·58	0·89	0·72	0·12	1·30
2·54	2·75	0·30		1·86
1·63	0·47	0·34	0·48	0·73
0·56	0·57	0·63		0·59
	1·34	0·24	0·54	0·71
4·46	4·17	1·44	1·95	3·00
	1·28		0·42	0·85

These numbers were obtained by taking the outlet and speed as explained. By taking the inlet and outlet Dr. Hobson obtained numbers which may be compared with the mean column just given.

P. c. of escape. Inlet and Outlet compared. 1st Month.	P. c. of escape. Outlet and Speed taken. 2nd Month.
4·32	4·63
2·53	1·30
1·42	1·86
0·06	0·73
1·13	0·59
3·46	0·71
1·15	3·00
1·10	0·85

Here there is a general uniformity, but we cannot expect identity as the dates are different.

In the first where the numbers are steady the results by both methods are probably quite the same when taken at the same moment, but enough has not been done to show exactly the amount of reliance to be placed upon the latter. The only question remaining regards the speed of the gas.

Mr. Fletcher's Method.

Mr. Fletcher has devised and occasionally used another method of estimating the muriatic acid, to describe which his own words will be used.

"The apparatus consists of a number of thin glass flasks each provided with a stopcock, and capable of holding about a quart. They are exhausted of air by means of a portable syringe, and one of them is applied by means of a piece of vulcanite tubing to each flue leading to or from the condensers. On turning the stopcock a sample of the gases in the flue is at once obtained, and the cock being reclosed the flask can be removed and taken home.

"It is necessary now to determine in each flask the amount of muriatic acid, and the amount of air or other uncondensed gas.

"To determine this latter the flask with its contents is weighed when quite cold, and while the flask is on the balance the stopcock is opened so as to allow it to fill with air, for there will have been a partial vacuum formed since the flask was first filled with the hot gases of the flue. The increase of weight now experienced will be the weight of the admitted air; this deducted from the weight of the flask-full of air gives the weight of the air that was associated with the muriatic acid.

"A comparison now of the relation the muriatic acid bears to its associated air in the flues leading to and from the condensers gives the per-centage of condensation which is sought.

"The amount of the muriatic acid is determined by rinsing out the flask and using a standard solution of nitrate of silver, or by weighing the precipitated chloride of silver."

There are certain advantages gained by this method; the gas can be collected in an instant, and before any attempts have been made to render any result of the negligence. It is a common thing to see a man rapidly running to the condenser on the entrance of the inspector; with this apparatus, the globes being all prepared before approaching the work, it is easy to be more rapid than any movements of the men.

Although the workmen behave in this way it is no proof of any neglect, they are naturally anxious at the moment to make sure of having neglected nothing, and we have no reason to believe that the masters have ever acted in an underhand manner. It may be well to have the power of acting rapidly, but we have no reason for adopting a suspicious policy in our inspections—such would be as decidedly contrary to the inclination of myself and colleagues as we believe it would be to the wish of the Government and the country.

This process of Mr. Fletcher's is not so well suited for fine condensation, as the amount in the flasks is small, but probably his ingenuity will surmount this difficulty. For strong gases it is very exact.

Minimetric Method.

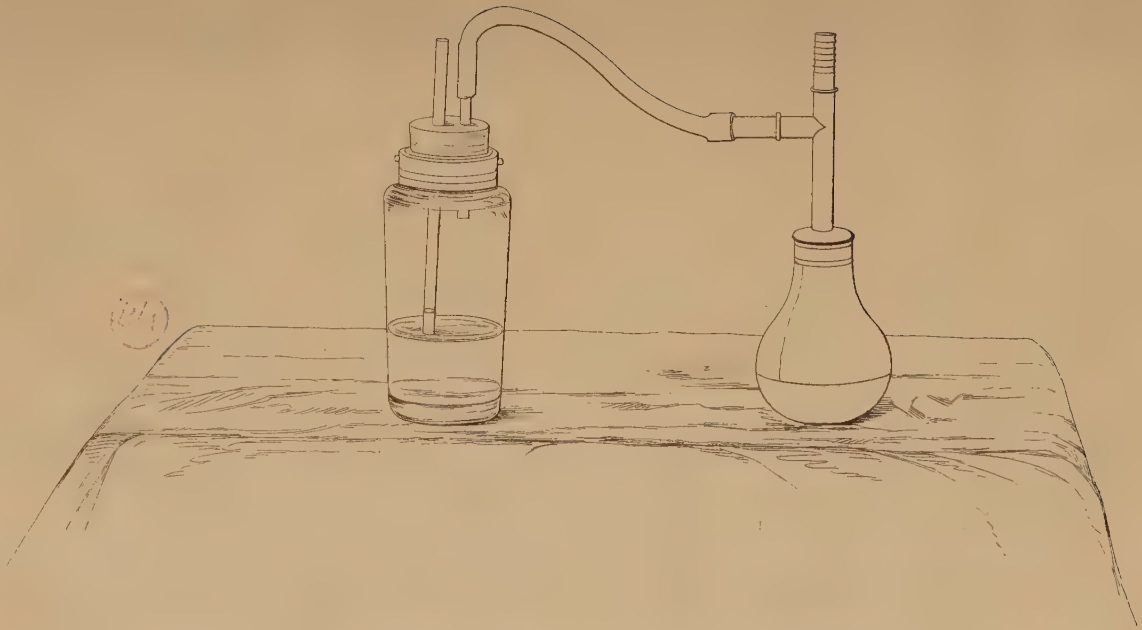
In my report on the air of mines, 1863, I described a method of estimating the amount of carbonic acid in the atmosphere. It consisted in finding the smallest amount of air which would produce a precipitate in a solution of baryta, using about half an ounce, or 14·17 cubic centimetres. It was based upon the observation, which I had found by many experiments to be correct, that we can retain in the memory with great exactness the character of one precipitate of given density if that density is not great.

If not strictly a new system it will be convenient to give it a name, as it seems probable that it will form a basis for all determinations of extremely small quantities of any substance, and especially of gases or substances in the atmosphere. It may be called the minimetric system, or method of analysis, and may be applied to liquids and indirectly to some solids by dissolving them in liquids.

The name may be said by some who are very scrupulous to be partly Greek and partly Latin, but the word meter may be considered as Latin although not originally so, and the compound is sufficiently euphonious.

The method adopted for carbonic acid may be adopted for muriatic acid; the particulars will be here given for that gas. Some other gases, offensive and otherwise, including also vapours, may be treated in a similar manner. It would, however, be needful that each gas and vapour should be examined to ascertain its degree of sensitiveness to the solutions employed.

It is ascertained that a certain amount of the gas to be estimated will give the precipitate required. A vessel containing that quantity may be used as a standard. We find that 1,000 cub. c. give a precipitate in 50 c.c. of silver solution where there is 0·0031 of hydrochloric acid per cent. If we use a vessel of that size and find no precipitate we may be sure that the amount 0·0031 is not present. If, however, we desire to be more refined and use a larger vessel we may do so, and satisfy ourselves that a definite amount, although less, is present.



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It may, however, be quite unknown to us how much is present, even approximatively. It may then be well to begin with a small vessel, fill it with the air to be tried, wash the air with silver solution, and fill again continuously until a cloudiness is obtained. For this purpose a small pump has been made, it is simply a caoutchouc ball with an inlet and an outlet valve attached, as in Plate XV. This apparatus I call a finger pump.

The bottle seen on the plate retains the solution in which the precipitate is to be made. Every time a fresh supply of air is passed into it, the solution is shaken to assist absorption. The air before passing into the bulb at *a*, passes through the solution.

Of course a bellows, or indeed any kind of pump, could be used to fill the bottle.

The finger pump is used qualitatively in testing condensation, that is, to test if there is any escape of gas whatever. It has also been used quantitatively for the determination of carbonic acid in the air, as will be more fully explained elsewhere; the minimetric method may be used when an aspirator is employed, or indeed any simple or complex apparatus which measures volume. When estimating the carbonic acid of the air corrections for temperature and pressure must be made, but such a calculation is useless in nearly all cases at alkali works.

After passing half a foot of air through a silver solution, and finding no precipitate in the silver, we may say there is not 0·012 per cent. of hydrochloric acid present.

After using a litre bottle and shaking the silver solution with the air it contains without finding a precipitate, we may say the air does not contain 0·0031 per cent. of muriatic acid.

After using the finger pump of 50 cub. c. 20 times before finding a precipitate, having shaken the solution as directed, there will be 0·0031 per cent. If once is sufficient to produce a precipitate there will be 20 times that amount, viz., 0·062. As this amount is very small it may, as far as the Alkali Act is concerned, be taken as nothing.

Here volumes per cent. are used; 0·0031 is equal to 0·0221 grains in a cubic foot, and 0·062 is equal to 0·442 grains in a cubic foot.

Supposing this latter quantity to be found in air at the outlet of the condenser and 100 in the inlet, we should have 0·44 per cent. passing off; if 10 in the inlet, then 0·044 would pass off.

If the inlet gas contained 10 grains in a cubic foot 0·0221 grains would be contained in 62·26 cub. cent., or 3·8 cub. in., so that the finger pump would require to be only of that capacity to produce a reaction. Perhaps it would be unsafe to operate on amounts of air so small. This method would be extremely exact for the dilute gas, but the certainty is not established by a practical use of it for strong mixtures of gas. When there is much muriatic gas there is much condensation, which must be carefully guarded against. If the gas contained 100 grains of

HCl to the cubic foot then 6·22 cub. c. = 0·38 c. in. would be sufficient to produce a reaction.

Considerable difficulty exists in managing an analysis when there is much moisture, from the fact that the acid condenses in any tube that is used. It is needful, therefore, that the tube should be as short as possible, and, if necessarily otherwise, the process must be continued proportionately long. Tubes must not be used moist, as they absorb still more acid. They must not be used for the outlet after they have been used for the inlet, as they may retain a large amount of vapour and liquid acid sending off vapour.

Table for a Finger Pump (or Bottles or Flasks) of 50 *Cub. Cent.*

The caoutchouc bulb of two ounces may be taken as 50 centimetres. It will be found that the error by doing so will be wonderfully small. About 6–7 centimetres of air will not be driven out, but each bulb must be measured, and the exact amount sent out, when pressed, must be found for accurate experiments.

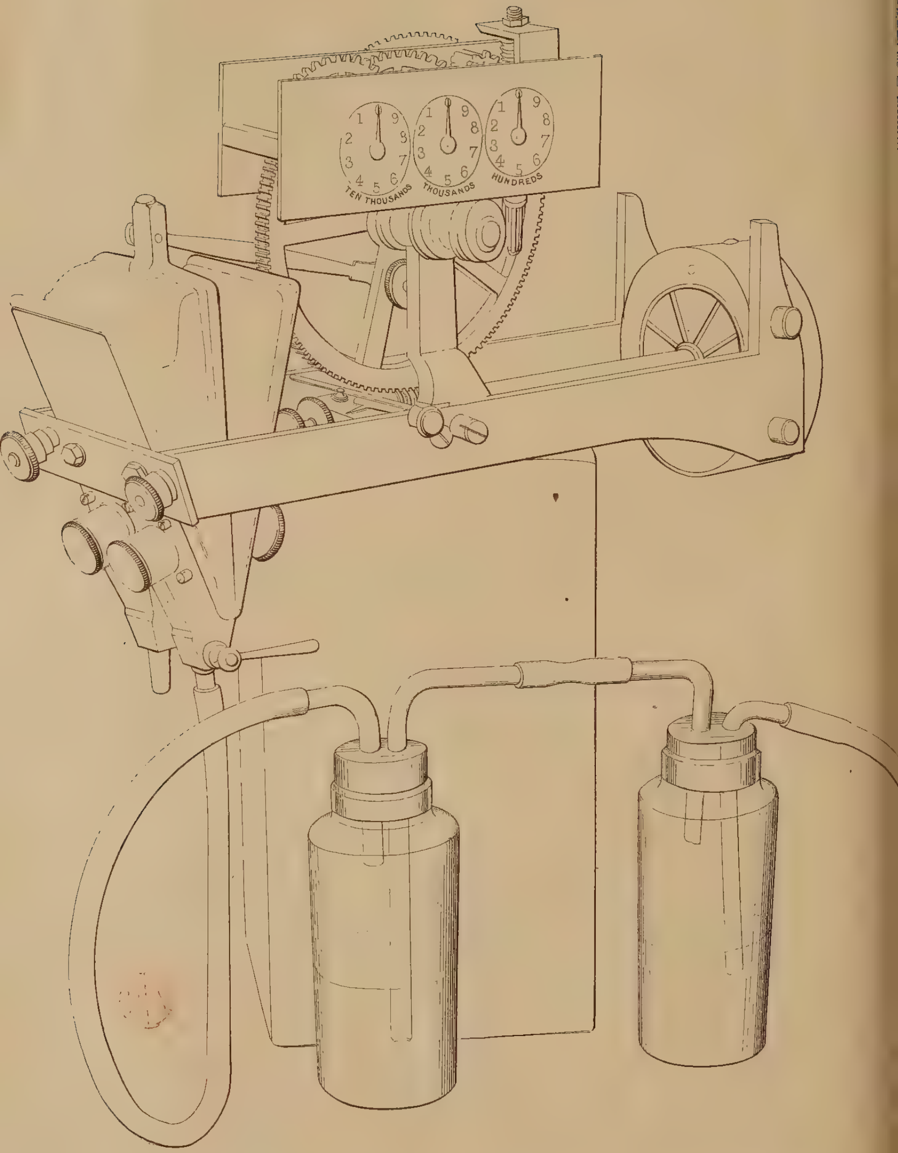
A cloudiness produced in 50 cub. c. (nearly 2 ounces of a weak solution of nitrate of silver) with—

——	Showing p. c. Muriatic Acid in the Air.	Produces a Precipitate in
1 stroke of finger pump	0·062	50 cub. c. of air.
2 ”	0·031	100 ”
3 ”	0·0206	150 ”
4 ”	0·0155	200 ”
5 ”	0·0124	250 ”
6 ”	0.0100	300 ”
7 ”	0·0088	350 ”
8 ”	0·0077	400 ”
9 ”	0·0069	450 ”
10 ”	0·0062	500 ”
20 ”	0·0031	1000 ”

and so on.

The last number given is a litre bottle, and the amount of muriatic acid is equal to 0·0221 grains per cubic foot, or we may put it thus; a precipitate produced by—

	Per cub. foot.	Per cubic metre.
1,000 cub. cent. in 50 cub. cent. of silver solution - =	0·0221 grains =	0·0506 grammes.
500 ”	0·0442 ”	0·1012 ”
400 ”	0·0552 ”	0·1264 ”
300 ”	0·0663 ”	0·1518 ”
200 ”	0·1105 ”	0·2530 ”
100 ”	0·221 ”	0·506 ”
50 ”	0·442 ”	1·012 ”
40 ”	0·552 ”	1·264 ”
30 ”	0·663 ”	1.518 ”
20 ”	1·105 ”	2·530 ”
10 ”	2·21 ”	5·06 ”


1
2
3
4
5
6
7
8
9
TEN THOUSANDS
THOUSANDS
HUNDREDS

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Every one will, perhaps, prefer his own standard, according to his eye and his habits. I give this as an example.

In the minimetric method I am inclined to think that we have a very simple solution of some of the difficulties attending the inspection of the principal chemical works, regarding that inspection as an art. Some persons believe that it may be well not to rely too much on any method, but rather to look to the general mode of management. To this, however, there is a greater objection than to the analysis of the atmosphere, as it is much more inquisitorial; and, after all, we must remember that if a man does no harm to his neighbours when he works in some dark den of his factory it is not for us to complain. If he does harm the inquiry is often made by examining the products rather than the process, if any objection to the inspection of the latter is offered.

Fan or Self-acting Apparatus.

The Report of the Select Committee of the House of Lords on "Injury from Noxious Vapours," contains the following question by the chairman, the Earl of Derby: "1557. If it were thought "necessary to insist by law upon the complete condensation of "muriatic acid, are you aware of any apparatus which could be "devised by which the fact of the escape, or the contrary, might "be ascertained?"—Answer by Dr. Hofmann: "I am not aware "of any apparatus of that description, &c."

It was found that many complaints were made against an alkali work at such a distance from Mr. Fletcher's residence that frequent visits were impossible. We considered, therefore, some method of accumulating observations by a self-acting machine, or at least one acting without supervision. Mr. Fletcher had great confidence in the plan of using the draught of the chimney as an agent for driving or drawing the gases through the solutions, and I requested him to carry out his views. It was found that a fan of two inches in diameter inserted into an opening in the chimney was sufficient to drive a bellows pump which would draw the gas through nitrate of silver.

The fan and pump are in fact the whole of the apparatus; it is driven by the draught which passes into an opening in the chimney, although it is not placed like a smoke jack inside, but in a box outside which may be locked, so that the register of work done in the absence of the inspector may be preserved. It is extremely probable that this apparatus will become a favourite with manufacturers themselves, who may find it necessary for their defence against unfounded attacks, as it certainly will be a favourite with an inspector who feels the difficulty of his position when giving an opinion of results during his absence.

Plate XVI. shows the single fan aspirator. At the right hand is the fan; in the middle is seen the spindle for moving the large toothed wheel. The connecting rod for driving the bellows pump is seen behind. The two bottles contain the solution through which the gas is to be passed. The bottles are not minutely described, as they can readily be understood; the plate taken from a very careful photograph by Mr. Mudd shows the whole external part of the apparatus so well, that words are not required in the description, but the separate parts will be found named in the next plate which contains all that is contained here with some addition.

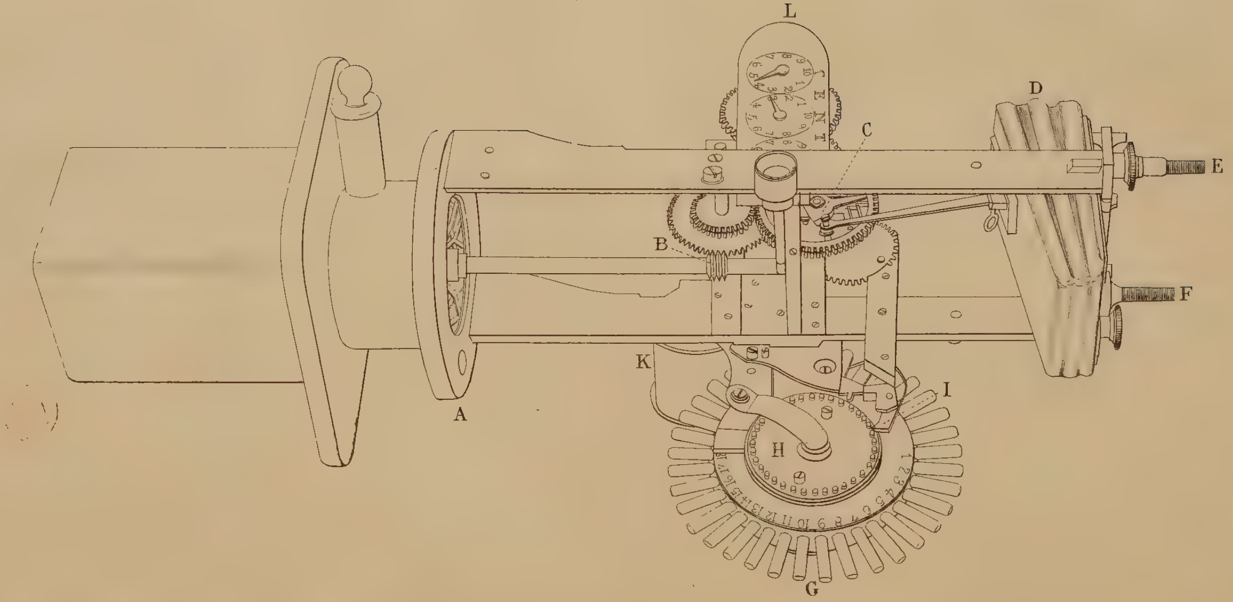
If the machine were left for many days a sudden ebullition of gas might in a few minutes precipitate all the silver, and although the bottle might still retain its average amount, no clear idea of the occurrences would be given by one such vessel. Mr. Fletcher therefore made a compound self-acting apparatus or fan aspirator, which registers the occurrences of several days, dividing the time into periods of any desired length, which may be 1 to 6 hours. The description will be given in his own words:—

" Much of my time has been devoted to the completion of the " self-acting aspirator or tell-tale alluded to last month.

" This apparatus is readily portable, and can be placed in " connexion with any flue or chimney; it requires only that a " hole 2 inches in diameter should be made in the brickwork. " Through this aperture sufficient air passes into the flue to cause " a small fan 1½ inch or 2 inches diameter to revolve rapidly.

" The fan is so placed immediately in front of the hole that it " is moved by the air from outside as it rushes into the flue. On " the spindle which carries the fan is an endless screw, this work- " ing into a toothed wheel gives motion to a small bellows pump " of vulcanised rubber by means of a crank and connecting rod.

" The pump draws a constant stream of air from the flue or " chimney through a bottle containing solution of soda, nitrate of " silver, or other absorbent of the acid vapour which may be in " it. The gas continues to pass in bubbles through the liquid in " this bottle for a period of from three to six hours; this time can " be lengthened or diminished at pleasure by an easy adjustment " of the apparatus, and at the end of that period the connexion " between the bellows and the first bottle is broken, and a con- " nexion established with bottle No. 2. The gas from the flue " now passes through the solution in this bottle during another " period of the same length, when it is diverted and made to " bubble up through that in bottle No. 3, and so on through any " number in succession. In the instrument that has been made " there are 36 four-ounce square bottles, occupying a space of one " foot square and four inches high. If each of these bottles come " into action at intervals of six hours, the whole will last nine " days, and then an examination of their contents would show " the nature of the gas that had been passing in the flue during " any six hours of that time. Attached to the apparatus is a " counting dial similar to that of a gas meter; this counts the " inflations of the bellows, and so indicates the number of cubic " feet of gas that has been drawn through the bottles. The " instrument may be adjusted to any speed, that of one cubic foot " per hour is found convenient. The speed will not, however, be " constant, as the draught in the flue may vary with the number " of furnaces at work, the direction of the wind, the height of the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“ barometer, &c.; and as it may be necessary to know the time at
“ which any one bottle was in action, a photographic timekeeper
“ has been contrived, at once much simpler and more
“ certain in its action than a common clock in such an atmosphere.
“ A ribbon of photographic paper enclosed in a dark
“ box is made to unroll from one reel on to another at a slow rate,
“ and in so doing to pass a narrow slit through which daylight
“ is admitted. The paper passes at the rate of half an inch per
“ hour, and becomes darkened as it passes the opening. When
“ the paper ribbon is afterwards removed it presents a series of
“ alternate dark and light spaces, each about six inches long,
“ shading off one into the other. The centre line of the dark
“ space will have passed the slit at noon, the centre line of the
“ light space at midnight, and the intermediate points at intervening
“ times, so that the paper may be marked out and divided
“ into spaces corresponding to days and hours. A mark is also
“ imprinted on the paper at each revolution of the wheel, which
“ determines the connexion of the successive bottles; the position
“ of these marks on the paper, now divided out into hours, gives
“ the times at which the corresponding bottles were in operation.
“ The successive connexions of the bellows with the several
“ bottles are made and broken by the sudden blow of a spring
“ lever on one of 36 pins projecting from the barrel of what may
“ be called a 36-way cock. Caoutchouc tubes proceeding from
“ each of the 36 bottles are attached to nozzles which radiate
“ from a strong brass ring, whose inner surface is ground truly
“ conical and exactly fits a conical plug. In this plug there is
“ only one channel, and this is always in connexion with the
“ bellows; as this plug revolves this passage comes in connexion
“ with each of the 36 nozzles in succession, and thus each bottle
“ in succession is put in connexion with the bellows and with
“ the flue.

“ There are some minor details in the apparatus which it is
“ unnecessary to describe. The whole is enclosed in a box
“ measuring one foot each way and which can be locked up.

“ The chief point attained is the getting an aspirator which is
“ constant in its operation and depends on no motive power
“ other than the draught of the chimney itself.”

Plate XVII. *showing the Mechanical Part of the Compound Aspirator.*

A. The fan 2 inches diameter.
B. The endless screw.
C. The crank to work the bellows.
D. The bellows pump.
E. The inlet tube.
F. The outlet tube.
G. The ring carrying 36 nozzles.
H. The centre plug carrying 36 pins.
I. The end of spring lever which moves H.
K. Box containing the ribbon of photographic paper.
L. The counting dials.

Plate XVIII. *showing the Compound Fan Apparatus in its Box with the Bottles and Tubes.*

M. Is the main tube of brass partly encircling the bottles and attached to each; it is in connexion with the chimney and through it the gas passes to each bottle in its turn.
N. A tray in which the bottles can be removed.
O. A lense to throw light on the small opening in the box containing the photographic paper.
P. The chimney or flue to which the aspirator is attached.

No. of Testings required in No. 3 District in order to ascertain the Per-centages of condensation.

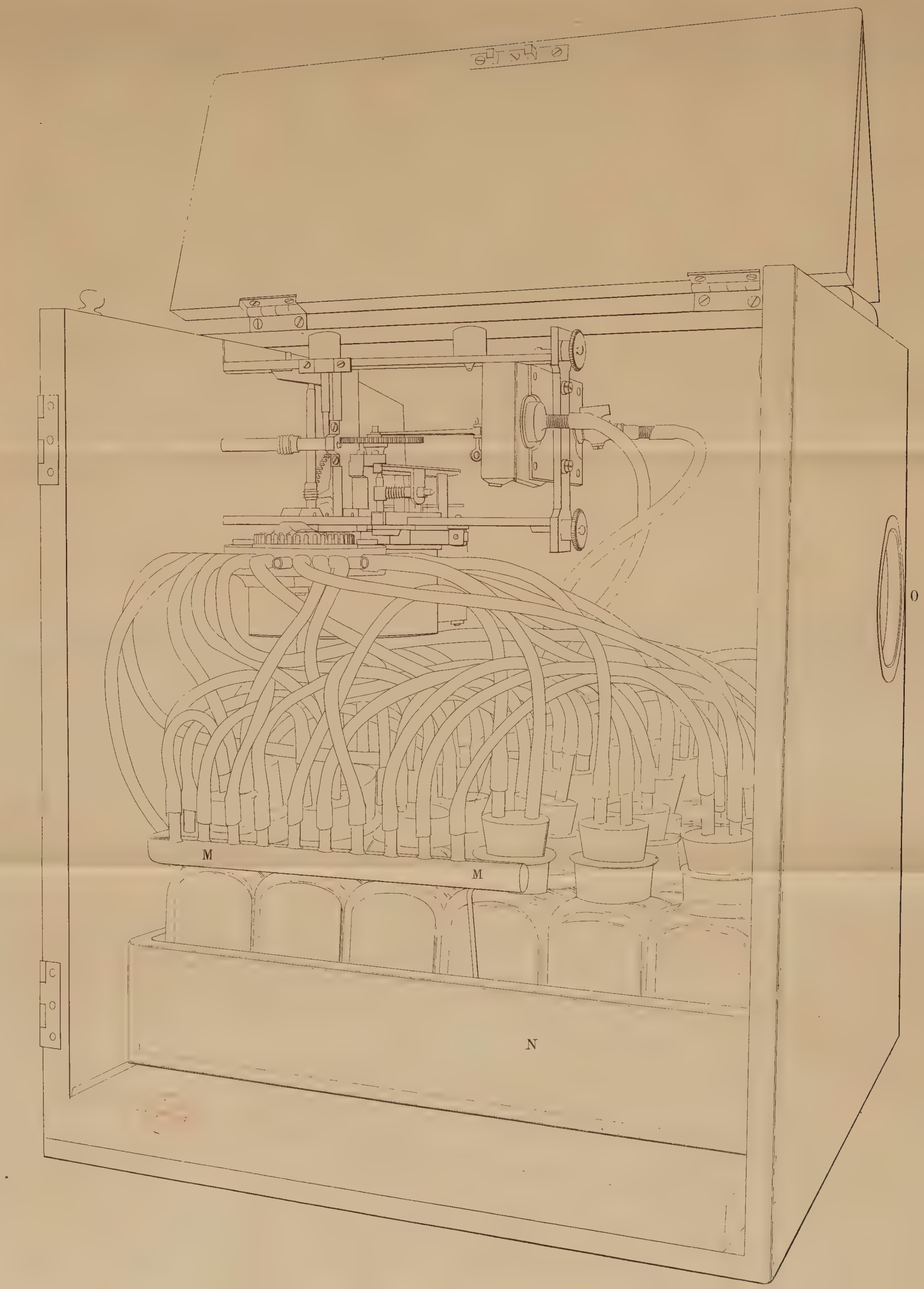
No. of work.	Pan inlets.	Pan outlets.	Roaster inlets.	Roaster outlets.	Total.
1	5	5	5	5	20
2	2	2	1	1	6
3	3	3	3	3	12
4	1 pan and roaster inlet, 1 pan and roaster outlet				2
5	do.				2
6	2	1	2	2	7
7	1	1	1	1	4
8	1	1 pan and roaster outlet		1	3
9	3	3	3	3	12
10	1	1	1	1	4
11	1 pan and roaster, 1 pan and roaster				2
12	1	1	1	1	4
13	1	1	1	1	4
14	2	2	2	2	8
15	6	6	6	6	24
16	1	1	1	1	4
17	1 pan and roaster, 1 pan and roaster				2
18	2	2	2	2	8
19	2	—	—	—	2
20	3	2	3	3	11
		Total number of testings required			139

In District No. 2. 75 testings are required, but longer journeys.
" 4. 68 testings required, still longer journeys.
" 1. 134 testings would be required, if condensation were less complete than it is.

Estimation of Muriatic Acid by measuring the Liquid.

Method adopted for estimating the amount of condensation at the Walker Alkali Works, Newcastle, from "The Industrial Resources of the Tyne, Weir and Tees," by Dr. Richardson, Sir W. G. Armstrong, T. Lowthian Bell, Esq., and John Taylor, Esq., quoted from Mr. Clapham's experiments, p. 167.

In the following experiments "the daily produce was conducted "into large stone cisterns, prepared for the purpose, and the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M
N
O

“ strength, depth, &c. carefully ascertained. The salt used was also
“ tested daily for moisture and impurities, such as sulphate, sand,
“ &c.; the former was found to average six per cent. during six
“ months trial, thus leaving 92·5 per cent. NaCl= 57·7 HCl in 100
“ parts of salt used. The crude sulphate of soda was also daily tested
“ for common salt left undecomposed, which is deducted below :—

	HCl	Test of Sulphates.
January 100 parts of salt gave	58·3	2·95
February	53·0	2·24
March	54·2	2·26
April	57·4	2·14
May	58·4	2·98
June	53·9	2·12
Average	55·8	2·45
Left in the sulphate of soda	1·52	
	57·32	
Loss per cent.	0·38	
	57·70”	

Mr. Kynaston’s method may be said to be the same as that adopted by Mr. Clapham and others, although he has described the process more fully than has elsewhere been done, see Chemical News, vol. 8, p. 269, 1863. His words may be given.

“ A large stone cistern should be prepared which will contain
“ 100 cubic feet of liquid acid, and as high as possible in proportion
“ to its length and breadth as the fall from the condensers
“ to the stills or chalk cisterns will allow. The cistern must be
“ connected with the condenser by a range of earthenware piping
“ so as to drain the condenser completely. Into the side of the
“ cistern a strong glass tube bent at right angles at each end
“ should be inserted perpendicularly and rightly caulked. It should
“ reach within three inches at each end from the top to the bottom
“ of the cistern, and should be protected from acid fumes and other
“ matters constantly floating in the atmosphere of a chemical
“ work by a wooden casing all around it, and which may be
“ attached firmly by means of iron clamps leaded into the flag.
“ If this is not done, the glass after a short time becomes covered
“ with a dark coloured most tenaciously adhering substance,
“ through which the height of the acid inside cannot be easily
“ discerned. Upon the board forming the back of the casing a
“ scale is drawn, which divides the length into cubic feet, according
“ to the capacity of the cistern, and these again into cubic
“ tenths ; a door should be provided for the case, which may be
“ made to fit airtight by laying a strip of sheet india-rubber
“ round its outer margin, and then by means of a screw at top
“ and bottom pressing it closely into its position. The cistern is
“ four feet square horizontally and six feet three inches high, all
“ inside measurement, and has a capacity of exactly 100 cubic
“ feet. With such an arrangement the quantity of acid can be

" measured to 0·1 of a cubic foot, a degree of accuracy which it is " not possible to arrive at by the rough and clumsy method of " dipping."

This method produces very accurate results, no doubt, but it was not found possible for inspectors. The cisterns cannot be emptied whenever we enter a work, and if they were emptied the process would be conducted in our presence with unusual precaution probably. Inspectors must observe not merely the capacity for condensation in the arrangements, but the actual process hourly in use.

Condensation at various Parts of the Apparatus.

At Messrs. Garrett's works at Wigan the amount of acid at various parts of the apparatus was estimated. The plan of condensing includes stone cisterns from which the gas passes into Wolff's bottles, and thence to the towers. The amount of gas found united with a cubic foot of air was as follows:—

Over the pot or pan - -	- 1207 grains.
After passing the stone cisterns	- 410
After passing the Wolff's bottles	- 6·81
After passing the tower -	- 0·025

The amount of condensation was performed in the following proportion:—

By the cisterns - -	- 66·04 per cent.
„ bottles - -	- 33·396 „
„ towers - -	- 0·562 „
Uncondensed - -	- 0·002 „

This is an example of condensation in its best state. It is not one that can be exactly imitated, on account of the length of time taken in the process, viz., four hours. In some cases even less than one hour is allowed for a charge. The Wolff's bottles and cisterns would not then be able to do the work. In later examinations the tower is given more to do than is indicated by the above.

Sulphurous Acid in the escaping Gas.

No. of Works.	Sulphurous Acid.	Muriatic Acid.
	Grains per cubic foot.	
	0·028	0·04
	0·12	0·40
	0·13	0·13
	0·11	0·14
	0·30	1·08
	0·43	0·26
	0·668	0·12
	0·24	0·48

It was necessary to examine the amount of this gas, as by the use of one of the methods of inspection just described the results would be given against the alkali maker to an unfair extent, unless the sulphurous acid were estimated and subtracted from the whole acid. The question may arise, whence does this sulphurous acid come? From the roasters the origin is not difficult to explain, as carbon comes in contact with the sulphuric acid. The amount arising from the pans along with the inlet gas has not yet been compared with the amount at the outlet or the escaping gas.

Muriatic Acid in the Atmosphere of Works.

Supposing the amount 0·0031 p. c. by weight, which gives a strong smell, to be floating about constantly in an alkali works, it may be estimated by the minimetric method with great ease.

Suppose the works to be 200 feet square and the gas to rise to the height of 50 feet, we should then have two million cubic feet 153,000 lbs. of air, containing 4·73 lbs of muriatic acid gas. Let us suppose this changed by wind flowing at the rate of five miles an hour, still keeping the same strength of acid in the air, and we have 132 changes or 620 lbs. in an hour, equal to more than six tons in a day. But the supposition is extreme. The works never are so haunted by the gas, as the men are limited in their amount of endurance. In such a case the smell would go to a great distance. There are, however, certain spots about a work which are in the condition supposed. I seldom find that such places extend for many feet, but I have taken the liberty of remonstrating in some such cases, although it would have been difficult to prove an infringement of the Alkali Act.

In former times the escape of some tons per day from a chimney was not uncommon, but the effect was not perceived within the work itself.

When I find it difficult to move about from place to place it is at least right to give some advice.

The amount floating about and lost by inexplicable means, including also errors of computation by measurement, is to some extent known for a well-managed works, as being under 1 p. c. according to Mr. Clapham.

At p. 55 he brings the calculation to 0·38, but I believe this refinement cannot always be attained without such care as men will not be persuaded to take. By the above extravagant supposition the loss would be great. It is brought forward to shew how much care is needful to prevent nuisance and commercial loss, and also to indicate that the amount of gas around a work may be estimated if needful, and that it must of necessity be less than the supposition. By following out this examination the whole atmosphere in and around a work may become known.

The amount floating often makes itself perceptible by forming a white cloud which causes great complaints; but as a cloud of this kind may become quite invisible when it is closely approached, there is a difficulty in proving a distinct cause of annoyance, although attempts have been made. If ammonia is dealt with at the works it combines with the muriatic acid and forms a cloud of still greater density, although less unpleasant to breathe than the acid alone, and often imperceptible to the taste or smell.

The occurrence of this condition of things has caused a good deal of annoyance, and it is difficult to explain to the public and to individuals that a great cloud forming a remarkable object for many miles is in reality less hurtful than other objects that do not so clearly strike the eye. It is also difficult for them to believe that inspectors should have no power to deal with an appearance so remarkable in their eyes. Two works especially have been brought before us around which or a part of which a white cloud sometimes forms; still we have never been able to detect an infringement of the Act. The neighbours say that our presence prevents it, and for this reason chiefly the self-acting apparatus described at p. 52 is devised.

VISITS TO ALKALI WORKS.

About a thousand visits have been paid to alkali works between March 1864 and January 1865. Generally testing of the works has been performed at these visits, but this is of course not always necessary. Sometimes the works have been standing still in order that improvements might be made. And sometimes it was advisable to consult as to the best mode of making the improvement. It has been necessary to be very careful not to give such advice as might appear to be an interference; we have no power to decide on the mode of producing the desired result. At the same time, it so frequently happens that the necessary improvement is self-evident to those who are experienced, that any hesitation to advise would be unfair and indeed simple pedantry. This is more especially seen when the manufacturer himself has not at all thought on the subject, and is obliged either to seek advice or to remain inactive.

The visits of the inspectors to alkali works amount to 976, but incidental visits, examining complaints, looking after apparatus, &c., make a large addition. I have visited all the works once, several of them twice, and some three or four times, according to requirements. Regular reports are received from my colleagues every month, and communications more or less lengthened almost daily from some quarter, but these will now become less frequent.

White Vapour from Alkali Works.

A source of complaint against the alkali works arises from the white vapour which is always found to proceed from the decomposing black ash or balling furnaces.

In these the sulphate of soda is heated with lime and coal. We have not succeeded in obtaining enough of the deposit from flues of this kind, and it occurred to me that we might take that from the blast furnaces to be the same or nearly the same, as in all probability the whiteness was caused by the lime and alkalies present in both. The white vapour from iron furnaces is similar in appearance to that from the balling furnaces at alkali works.

The deposit on the top of a blast furnace consisted of—

Arsenic	0·08	per cent.
Oxide of lead	·24	
Peroxide of iron	23·35	16·03 soluble, 7·32 insoluble
Alumina	14·37	
Silica	26·63	
Sulphate of lime	12·76	
Carbonate of lime	2·50	
Lime	2·12	probably with silica.
Sulphate of potash	6·66	
Chloride of sodium	4·89	
Sulphate of soda	1·72	
Magnesia	1·63	
Carbon	1·95	
Lithium trace		
Vanadium trace		
	98·90	

ANALYSIS of smoke deposit from another blast furnace.

	per cent.
Arsenious acid	0·08
Oxide of lead	0·07
„ cobalt	trace
„ manganese	0·72
„ zinc	0·14
Sesqui-oxide of iron	19·71
„ aluminum	11·09
Lime	10·47
Magnesia	4·27
Silicic acid	21·74
Phosphoric acid	2·79
Carbonic acid	0·16
Sulphate of lime	4·35
Hydrate of lime	0·37
Sulphate of potash	9·00
Chloride of potassium	2·33
„ sodium	3·06
Lithia	trace
Carbon	3·62
Sand	4·40
Moisture	0·80
	99·17

Mr. Wm. Browning made the first, Mr. John Dalziel the second analysis in my laboratory.

A large portion of the earthy powder is deposited in the flues when the gases from the blast furnaces are used for combustion, and by this means prevented from passing into the atmosphere. This is a second advantage arising from that discovery. The above analyses are given, not to prove that the smoke from the black ash furnace is actually so composed, since the lead, arsenic, and iron are probably quite absent, but to show that lime, soda, and potash salts with silica also, may be taken up into the atmosphere and form a white smoke. These are probably the principal if not the only solid substances which are emitted from the balling furnaces of the alkali works. The appearance is similar in some respects to muriatic acid, but there is scarcely any smell, or at least not one to be compared with the smell of muriatic acid, either in quality or intensity, supposing even that the latter acid were present in quantities less than 0·003 per cent.

The presence of a white vapour is no proof of the presence of muriatic acid.

Expense of Condensation.

It was my belief that the amount paid annually for damages done by the escaping muriatic acid would, in many cases, be sufficient to make all the alterations required for condensation within the Act. I have received only one letter bearing on this subject; it is from the owner of a large work. The amount paid by him for the last four years has been 150*l.* per annum for damages. The expense of alteration so as to bring condensation within the requirements of the Act has been 300*l.*, so that the compensation paid in two years is sufficient to remove the grievance so far. Considering the sum of 300*l.* as capital, condensation within the Act becomes a saving of expense.

The owner above referred to adds, "We contemplate expending a much larger sum than this for further improvements." When the improvement advances to such an extent as to condense 95 per cent., there is generally a desire to proceed farther.

In some cases the muriatic acid sent into the atmosphere was actually much wanted in the works for the production of chlorine. Its condensation has then been a great advantage, and a means of enlarging the business.

Apparatus required or occasionally used in testing.

Fine balance and weights.

A collection of the usual chemical re-agents in solution in bottles.

A cubic foot aspirator.

A swivel glass aspirator.

Simple fan aspirator or tell-tale.

Compound fan aspirator or tell-tale.

A flexible aspirator without water.

A finger pump as aspirator.

A pressure gauge.

Anemometer.
A foot rule.
Hydrometer.
Glass globes.
Air pump to empty the globes.
Absorption tubes and stands.
Beaker glasses and globes.
Burners for gas.
And a few other things required in small laboratory experiments.

THE GENERAL RESULTS OF THE ALKALI ACT.

The alkali works have now been inspected for more than three quarters of a year, speaking in January 1865. The Act came in operation at the beginning of 1864, but circumstances rendered the appointments rather late, and it was not until March that the officers were at their posts. After that time three months were required in some cases to fit into a new occupation and to produce familiarity with the ideas, so that the early portion produced in some cases only a nominal inspection.

By degrees, however, greater accuracy was attained, and we ventured to give opinions, without fear, on a few points which gradually increased in number.

The knowledge of good modes of condensing was not general among the alkali makers, the knowledge of the amount of escaping gas and the mode of estimating it was also imperfect; and men who imagined themselves free from all blame were surprised to find that they were sending into the air several times more than the law permitted.

Beginning as I did with a strong desire to aid the public in the way most agreeable to the manufacturer, I could not forget that it was in his power to put very many interruptions in the way, and to make the office of inspector most difficult and disagreeable.

I am happy, however, to say that in no instance known has any act been performed to which we can in the slightest degree object, and if in some cases the delay in the alterations was greater than absolutely needful, it may perhaps be said that it was well to wait for the full proofs of deficient condensation, and to satisfy each manufacturer of the accuracy of the statements regarding his own works.

At the beginning of this year the results of the exertions made began to show themselves more rapidly than was expected, rendering it necessary at a late period to change the character of the report and, perhaps, to write some of it rather rapidly.

It was believed by some that in two or three years it would be possible to bring every work to a compliance with the demands of the Act. It is gratifying to be able to say that this result has been brought about in the first year. It is no less pleasing to be able to add that the success in many cases has been more complete than had been anticipated. Sometimes a complete change has been effected with very trifling alterations of apparatus, the experience gained by the study of condensation or absorption under various conditions having been sufficient to enable us to see readily defects which had escaped the eyes of those accustomed to view their own processes only.

I have left out of the list of alkali makers a few who decompose a small amount of common salt in London and claim to be exempted from inspection. I have not taken time to consider the arguments sufficiently, as it was more important for the public that the condition of the large works should first be made satisfactory. One of the larger works will decompose in a year several thousand times more salt than some of the smaller establishments alluded to, in which the production of muriatic acid is only occasional.

I am quite unable to say anything regarding the change in the neighbourhood of alkali works, or the effect on the growing crops. Several letters as early as last summer gave a flattering account of roses which grew where none had grown for years, and of fruit trees which had begun to blossom after having long ceased. A meeting of farmers in the same neighbourhood decided unanimously that the gain had been great, and some land agents around gave a similar opinion. Still we must remember that the last was an unusual summer, and it would be well to wait for a repetition of the results. That results will show themselves it is scarcely possible to doubt, as the amount of muriatic acid condensed is really great. Vegetation is peculiarly sensitive. Mr. Balmain, in St. Helens, after passing gas from his condenser through nitrate of silver led it among growing flowers covered with a glass shade. These flowers appeared healthy for a fortnight, but suddenly in two hours they died; a less perfect condensation had occurred for a short time, but so delicate were the flowers that although they clearly showed this difference it could not be traced by any other method.

Whilst we conclude from this accident that vegetation is extremely sensitive, we must perceive also a new form of proof that great progress has been made in the art of condensing.

I have the honour to be, &c.

R. Angus Smith.

Manchester,
February 15, 1865.

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CHILDREN'S EMPLOYMENT COMMISSION (1862).

FOURTH REPORT

OF

THE COMMISSIONERS,

WITH APPENDIX.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
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1865.

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CHILDREN'S EMPLOYMENT COMMISSION (1862).

FOURTH REPORT OF THE COMMISSIONERS.

TO THE QUEEN'S MOST EXCELLENT MAJESTY.

May it please Your Majesty,

1. We, the Commissioners appointed by Your Majesty to inquire into the Employment of Children and Young Persons, in Trades and Manufactures not already regulated by Law, humbly present to Your Majesty the Fourth Report of our Proceedings in the execution of Your Majesty's Commission.

The Metal Manufactures of the Sheffield District.

2. Our Third Report dealt exclusively with metal manufactures.

Recapitulation of recommendations in Third Report as to furnaces and rolling mills.

3. Of the three principal denominations under which the metal trades and manufactures naturally fall, the two first, as stated in our Third Report, § 7 are:—

I. The blast furnaces, in which iron is smelted.

II. The rolling mills and forges, in which the pig iron is converted into certain objects of manufacture, as plates, rails, rods, bars, wire, &c.

4. Upon the conditions of employment in reference to the young, and their physical and moral results, we gave in our Third Report the results of our inquiries in the districts of—

South Staffordshire,
Worcestershire,
Yorkshire,
Durham,
Northumberland,
Scotland,
North and South Wales.

5. We considered that inquiries embracing those districts were sufficiently exhaustive, the few localities omitted (North Staffordshire, Shropshire, Derbyshire, and one or two smaller ones) not presenting any peculiar features especially calling for investigation.

6. We therefore, on the evidence collected in the districts specified in § 4., felt called upon to recommend that the iron furnaces and the rolling mills and forges should be placed under the regulations of the Factory Acts; the principal effects of which in these branches of manufacture would be—

The abolition of night-work for the young,
The securing the half-time system of hours of work and education for all under 13.

We also recommended—

The abolition of Sunday work, &c.,
The forbidding the employment of females on the pit banks, and on the coke hearths.

And that—

The hours of meal-times, designated by the Factory Acts, should not be made applicable to the boys employed by puddlers.

The facts and conclusions as to furnaces and rolling mills not varied by the additions to the evidence in this Report.

7. The additions made to the evidence on these subjects in this Report, in reference to Yorkshire and Derbyshire, in no way vary the facts or the conclusions (Mr. White, a., Nos. 164–179); neither are they varied in any degree by the Report of Mr. Longe on the copper works of South Wales. (E. 1.)

8. The third division which we adopted in our Third Report (§ 7.) was that of—

III. The miscellaneous metal manufactures,

and the localities with which we dealt, where these trades and manufactures are carried on to a great extent and in great variety, were those of—

The Birmingham District,
The Wolverhampton District,
The Lancashire District.

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The only remaining locality of any great importance was that of—
The Sheffield District;
and to this we proceed to call attention.

Classification of miscellaneous metal trades in Sheffield district.

9. The following classification of the miscellaneous metal trades and manufactures of this District is deduced from the evidence collected by Mr. White.

I. Grinders.

The different branches of the grinding trade are stated to be the following (a 2.)

1. Forks.
2. Spring knives.
3. Razors.
4. Scissors.
5. Table knives.
6. Edge tools and wool shears.
7. Saws.
8. Surgical Instruments.
9. Files.
10. Sickles.
11. Jobbing grinders.

II. General steel and iron manufactures, including a wide range of productions, from—

Armour plates.
Ordnance.
Heavy miscellaneous castings,
down to—
The finest files; and to
Wire almost imperceptible. (A. 15–18.)

III. Cutlery. This term is used in Sheffield in a narrower than the popular sense, being taken to mean only the—

Handling, Making up, and Finishing	- of -	Knives, Razors, Scissors, &c.	in -	Bone, Ivory, and Wood.

IV. Electro-plate and white metal trades.

V. Brass founding. (Ibid.)

10. The succinct summary of the evidence given by Mr. White in his Report shows in the clearest manner, that all the circumstances which point to the necessity for protective legislation in behalf of the young, in the miscellaneous metal trades of the Birmingham and Wolverhampton districts, as detailed in our Third Report, exist in the same, and in some respects in even a greater degree, in the Sheffield district.

Recommendation of 3rd Report applicable to Sheffield.

11. It results also from the consideration of the evidence that the recommendations which we had the honour to submit in our Third Report, as applicable to the case as far as it was then before us, are, as we anticipated, no less applicable to the Sheffield districts, and to the few other small localities of the miscellaneous metal manufactures of the kingdom.

Only a few points in Sheffield district will be touched upon.

12. We only therefore think it necessary in this Report upon the Sheffield district, to touch upon a few points which seem specially to deserve attention.

Previous Reports on the Sheffield district. Report of Mr. J. Symons in 1841.

13. The conditions under which the grinding trade is carried on in Sheffield have for many years attracted notice. The evidence collected by Mr. Jelinger Symons under the Commission of 1841 discloses the terribly destructive nature of the occupation. It also proves that mechanical precautions of a simple and inexpensive nature, and due attention to the sanitary state of the places of work, would have a most important effect in diminishing the evils connected with the employment.

Report of Dr. Greenhow in 1860.

14. Dr. Greenhow, under directions of the medical officer of the Privy Council, renewed the inquiry in 1860, as a portion of his more general investigations into the industrial conditions of the population in various districts having excessive mortality from lung disease. He showed that the very high rate of mortality amongst the grinders still continued, and that it might be stated to amount to an annual average rate of 13 per 1,000, "a rate which nearly corresponds with that among the men of the lead " mining districts, is considerably higher than that of the men of the principal manu- " facturing towns, and is more than double the rate which has prevailed in any one of " the three extensive rural areas in different parts of the kingdom, which may be used " as standard or normal rates." (Third Report of the medical officer of the Privy Council, 1860, p. 123.)

15. Dr. Greenhow attributes the excessive mortality to three principal causes; 1, the liability to inhale dust; 2, the maintainance of a constrained position while at work; 3, working in ill-ventilated work-places.

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16. Of the first, the liability to inhale dust, he states that it is "the most efficient cause "of pulmonary disease among the operatives of Sheffield, and also that which is most "capable of proof" (p. 120).

Dr. Greenhow's description of the various occupations in Sheffield.

17. The following is a full and comprehensive description by Dr. Greenhow of the various occupations in Sheffield, in which the workmen are liable to inhale an atmosphere charged with different kinds of dust,—metallic, and that arising from stones, bone, ivory and other materials.

"The liability to inhale an atmosphere more or less charged with dust, is common to the operatives employed in several of the manufacturing processes of Sheffield, such as the grinders of cutlery or other steel goods, the cutters and polishers of bone and ivory handles, the polishers of combs, the converters of iron into steel, the hacklers of Mexican fibre, and the sorters of hair. Of these several classes the grinders are probably the most numerous, and are unquestionably those whose health is most liable to be injured by their occupation. Their work consists in grinding the edge of knives, razors, scissors, tools, and other articles of cutlery, the points of forks, and the 'bolster' or rounded part near the handle of table knives, the shanks of scissors, the backs of razors, and such like articles. They are called, according to the articles which they grind, razor, fork, knife, scissor, saw, scythe, or file grinders, and may be conveniently classified as dry, wet, or mixed grinders, according to whether they grind exclusively upon a dry or wet, or sometimes upon a dry, sometimes upon a wet grindstone.

"To whichever of these classes the grinder may belong, he is exposed to the danger of inhaling air loaded with fine dust, both while 'razing,' *i.e.*, preparing, and 'hacking' the grindstone. The former of these processes is in general only required when fresh stones are being hung, and the operation consists in bringing the stone, while revolving on its axis, into shape, and to the requisite evenness, by means of a bar of steel. Clouds of dust are formed during the process, and fill the atmosphere of the workshop. Stones wear out quickly or slowly, according to the nature of the articles ground upon them, some lasting for five or six months, others wearing out in the same number of weeks. Hence the frequency of the grinder's exposure to this cause of a dusty atmosphere varies much according to the nature of his employment. Grindstones commonly require to be hacked daily, sometimes twice or thrice in the day. This process consists in roughing the grinding surface with a pick-axe. The stones are both 'razed' and 'hacked' while in a dry state; and, excepting that some of the more prudent workmen cover the mouth with a handkerchief, to prevent their inhaling the dust, no precaution is used to guard against the danger to health arising from this cause.

"Dry grinders use the dry stone only, and large quantities of fine dust, composed partly of steel, partly of sandstone, are produced during the act of grinding. These men formerly adopted no precaution against inhaling the dust, which they are apt to do very freely, seeing that they sit directly behind, and, as it were, astride the stone, in order that they may be close to their work. Some still continue to work in the old manner, without protection; but the greater number now use a fan, similar to that used by the needle-pointers, which draws the dust into a shaft, and very greatly diminishes the liability of the grinders to suffer from this cause of pulmonary disease. The value of the fan was fully exhibited in some of the fork grinders' shops, where streams of sparks, as the red-hot particles given off from the friction of the stone and steel appear to be, were observed suddenly to turn downwards into the shaft as they came within the influence of the in-draught of air.

"After being ground the articles are finely polished, or, as it is called, 'glazed,' upon a wooden wheel, coated with a paste containing emery. Dust is evolved in this process likewise, but much less abundantly than in dry grinding. The same men sometimes do both kinds of work, but more frequently the grinders have apprentices, or hire journeymen, to glaze the articles when ground. The principal articles ground on the dry stone are forks, razor backs, the 'bolsters' of knives, the rounded parts of scissors, gimlets, augers, and various other tools; the bright rounded portion of fenders, fire-irons, and stove grates, and spindles and flyers for spinning-mills. In grinding the smaller articles the men sit behind their work, towards which they lean, but in grinding larger articles they sometimes stand. A factory at Leeds was visited, where spindles and flyers are ground, and where the stones are placed at such a height as enables the men to stand conveniently at their work, and are so well screened, that, aided by a powerful fan, the operatives are effectually protected from the dust. By working in a standing position they also avoid the stooping position maintained by the Sheffield grinders, which is supposed to be one cause of their tendency to suffer from pulmonary disease. It is found to be difficult to screen the grindstone so effectually in grinding large unwieldly articles, such as fenders or fire-irons; and as the fan does not work well unless the stone is partly encompassed by a screen, the men employed in grinding such articles are more exposed to the evils arising from their occupation than other dry grinders.

"Wet grinders work entirely upon a stone which, revolving in a trough of water, is kept constantly wet while at work. They are exposed to the same influence as other grinders while razing and hacking the stones, and, like them, also stoop much while at work. Wet grinders are exposed to damp, and are liable to get wet in the legs and feet. The grinders assert that the use of the wet stone does not entirely prevent the evolution of dust, but that a small quantity of very fine dust, only perceptible in bright sunshine, is given off into the atmosphere. The edges of cutlery and edge tools, saws, and files, are ground upon wet stones. Mixed grinders work partly upon a wet, partly upon a dry, grindstone. A considerable difference exists in the proportion of time spent by mixed grinders in the respective processes of wet or dry grinding, which varies according to the nature of the articles ground."

Same causes of disease still in operation.

18. Mr. White, conducting his inquiry in 1865, shows that the same causes of excessive disease are in operation with the same fatal results.

As to fork grinders.

19. Of the fork grinders it was said by Dr. Hall in 1857 that they are "exposed to "influences which have a tendency to rob them of 25 years of their lives, and to deprive, "to that extent, their wives and families of the benefit of their labour and to fill the "union houses with their widows and orphans" (a. 2.) In an address presented to the

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public the fork grinders stated that their average age at death did not exceed 30 years (*ibid.*) In the same year the average ages of the grinders at death at five out of the ten principal places of work in Sheffield were given by Dr. Hall, as follows :—

Name of Wheel.	Return of Deaths since the Year	Average Age at Death.
Messrs. J. Rodgers and Son	1836	42
Union wheel - -	1850	40
Soho wheel - -	1845	40
Old Park wheel - -	1844	41
Suffolk works - -	1845	38½

Razor grinders.

20. In an inquiry 20 years previously by Dr. Holland, formerly physician to the Sheffield General Infirmary, the same fearful rate of mortality amongst some kinds of grinders is shown, and their condition, Mr. White states, "remains the same" (a. 3.) Among the razor grinders at that time, 749 out of 1,000 died under 40 years of age, whereas in the town generally only 352 died in 1,000; less than one-half. Dr. Holland proceeded to say that he was anxious that those facts should be clearly understood, anticipating that the time is not far distant when the Legislature will deem it necessary to interfere to arrest the progress of evils which admit to a considerable extent of remedial measures (*ibid.*), and he added that "the circumstances which abridge life, fall also with "peculiar severity on the young employed in the trade."

21. A few instances from the evidence of the men found at work at the present time by Mr. White will suffice to show that although "some improvement has been made" since that time the general features of the case remain the same.

File grinders.

22. William Attersby, file grinder, states (a. 23),—

"We file grinders grind wet; my stone looks so dry, because if I had much water it would take the cut off the stone too much. It is not at all healthy work. I feel 20 years older than I did seven years ago. I began at 10 years old, and am now 39. File grinders' average age is only 32. I know this, because I was asking our secretary the other day what it was now. I buried one brother at 29, another at 39, and my father died at 36; all three were file grinders. One brother died of the grinders' asthma, the other broke a blood-vessel."

23. The account given of himself by a witness, Joseph Travis, now an in-patient in the Sheffield Infirmary, is characteristic of the class (a. 25),—

"Till 12 years old I helped at farm work, and it would have been a good job if I had kept to it. I then went to the grinding. It is a destructive trade, though the grinding is done wet. It works in two ways. First, you must stoop over it so and have all the weight to throw from the chest, and it is very heavy work. Some files are 13 or 14 lbs. It is not as if any one were working loose or free. Besides this it hurts the breath, owing to the steel and the smell of sulphur. The steam rises, especially when you take up the file to look at it, and the steam has stone and iron in it, which get inside you and set there like steel itself. You can taste it as plain and spit it as if you were spitting steel." * * "By 40 it had got hold of me, the asthma, we call it; there is no remedy for it. Before that I had not found it so much, but always after working hard I had felt all the steam in me and felt my breath bad. I was pretty steady in the fore part of my time, but I have drunk my share for the last 20 years. Drinking, however, has, I think, nothing to do with it. I have seen some 'go off' without drinking, and others who have drunk hard and worked hard, go on longer. There are only two or three men, I should think, in the trade older than I am, viz., 55. They seem to rot off at 34 or 35, and some at 23 or 24, according to their constitution."

Mr. White's general summary of influence of employment.

24. The summary given by Mr. White (A. 100) of the influence of the grinders' employment upon their physical condition is conclusive as to the general prevalence at the present time of the evils, causing severe injury to health and premature decline and death in that occupation.

Number subject to those influences.

25. The number subject to such influences are undoubtedly considerable. The exact statistics of the trade are not to be gathered from the census returns of 1861, as the classifications "do not follow the many technical divisions of the Sheffield trades" (a. 30.) The nearest available approach to an accurate return is therefore that given by Dr. Hall in 1857, from which it appears that at that time the number of grinders in and near Sheffield was 5,029, of whom about 3,110 were men, and about 1,847 were under the age of 21. The table embodying the 11 different branches of the occupation of grinding, with the numbers of men and boys employed in each branch, and a volume showing the average age of all those above 21 then living and at work at the trade is given at b, page 2.

Remedial measures.

26. The principal remedial measures for the great amount of human suffering and loss of life shown to exist in this branch of trade is happily one, the efficacy of which has been distinctly proved by experience, and which is neither costly nor difficult of general application. Not only in the case of dry, but also to a certain extent in that of

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wet grinding, the use of the fan has long since been acknowledged to be of great value as a protection from disease. On this subject Mr. Joseph Mallinson, secretary to the razor grinders, thus expresses himself (a. 38),—

"The average age of razor grinders at death has been taken at different times, and usually estimated at 36, but it is now I believe 42. This change is owing to the more general use of the fan. Temperance and steady habits make a great difference to the effect of the work on the health, but I do not think there has been much improvement in the trade as regards these."

27. William Brown, cast-fork grinder, states (a. 12),—

"Began this trade at 10 years old. Worked a many a year without a fan, but for the last 18 have had one, and should not like to work without it now. Have found great benefit from it, and anyone would that works dry. Before I had it I used to feel the dust upon my lungs. Now I can work full days and am pretty well for health." * * "My fan works for my three troughs, for the dry-grinding, glazing, and all. There is a deal of dust from glazing. It cost me 35*s.*, and 18*s.* more for fittings."

28. Joseph Sanderson, fork grinder, states (a. 14),—

"I grind steel forks part of my time, perhaps a third, and metal forks the rest. The hull is very small and the five troughs crowded side by side as close as they can be. There is a fan which acts for all the five troughs. It was put up by the proprietor, and with the fittings complete for all the 10 workers, cost probably about 5*l.* We do not pay anything more for it. This used to be required sometimes, I believe, but now fans are more common, and I do not think that they are charged for.

"There is no comparison between working with a fan and without. Men did not live beyond 35, and now there are some as old as 60. Have worked with a fan for the last 15 years, and am now 49."

29. Thomas Roebuck, states (a. 15),—

"About five years ago I put up a fan for two troughs at my own expense and find great benefit from it. It cost me 4*l.* 10*s.* But when I work hard I feel a pain in my side still, because you cannot get rid of all the dust.

"We find all our implements, *e.g.*, stones, bands, &c., everything in fact but power and fixtures, for ourselves. The rent paid is 6*s.* a week for two troughs, or 3*s.* 6*d.* for one. This is the general way all over Sheffield."

30. William Attersby, states (a. 23),—

"There is no question but a fan would do a great deal of good at wet-grinding as well as in dry if we could have it. But so much wet flies off the stone that a fan would not carry off. You can see how thick it cakes on the board opposite. In a short time it will be as thick as that (nine inches)."

31. John Mason, edge-tool grinder, states (a. 27),—

"I began many years ago, very young, and have worked in five or six different wheels, but never had a fan in any. It is the best plan that ever was invented. The reason why grinders do not use it more is that it is a bit of expense. A fan for this hull, with pipes for each of the 12 troughs, so as to give the benefit to all, would cost about 10*l.*, perhaps."

32. Again, where wet and dry grinders work in the same room, the use of the fan is desirable for both parties.

33. Mr. Jonathan Wragg, secretary to the table-knife grinders, states (a. 39),—

"Fans are not used at all by table-blade grinders, as so little of the grinding is dry, and the stone used is of a very hard kind and not so destructive as the soft kinds used for some other things, *e.g.* razors. Indeed I do not know of any wet grinding in which fans are used. Dry grinders, however, work in the same room with wet grinders, but one of the latter, *e.g.* a file grinder, likes to get as far as he can from one of the former. The dust of his neighbour is no doubt an annoyance to him. I have never myself found much inconvenience from either my own or my neighbour's work, except from the noise made by stove-grate grinding in the same hull, which is very great. No doubt if the windows were close, like those of this sitting room, I should feel great annoyance from the dust."

34. William Dyson, formerly a scissor grinder, states (a. 40),—

"It is true that the fan, when used, takes away much of the bad effects of the work, but it is only very partially in use, and the men have now to work longer hours. The regular trade hours at wheels are from 7 till 7 or from 8 till 8 and the men cannot work longer, as the engines only run for that time. But the men work very irregularly, some not more than three days in the week.

"The fans are used in some, but only in a few places. Taking Sheffield through, not one hull in three has them; most of the fork grinders have not. If there is one which the men can use, they often do not, and if you ask them why they do not, they say, 'What do I want with a 'fanny?' 'A short life and a merry one' is their rule. When it is used, the pipe is put up by the men themselves, at their own cost, and if a man has the thought to put one up he generally has the thought to use it, but it is only the more thoughtful who have. Those who have put them up and used them at their own wheel complain much of the inconvenience which they suffer from the dust, if, as sometimes happens from an accident, &c., they have to go and work at another wheel where there are none, but others do not seem to mind. Some of the wheels are in a very bad state; killing shambles, I call them."

Expense of fans small.

35. As to the expense of putting up fans, it has been seen in some of the instances above quoted how small it is. The following evidence is conclusive to the same effect:—

36. Mr. Joseph Mallinson states (a. 38),—

"The fan could easily be applied to any kind of work in which dry dust is produced. I used it myself even at polishing. In grinding the kind of razors of which the largest quantities are made, a man will be perhaps only an hour or so in each day working on the dry stone. If a grinder has a boy, the boy will do more of the dry work than the man. Boys begin with glazing and polishing. The fan is used by many dry grinders, but by no means by all; I cannot say by what proportion, but should think that perhaps seven out of ten who do dry work do not use it. I attribute this more to the

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neglect of the men than anything. Steady men generally get one for themselves, but they may suffer from others who work near them and will not use it. A fan fitted for a single trough will cost about two guineas, and for a whole hull, with six troughs, perhaps four guineas."

37. Mr. Wragg states (a. 39, page 10),—

"The expense of making wheels fit to work in and comfortable would be so small that it could not increase the rent enough to matter to the grinders. It need not increase it all, for at some of the best arranged and most comfortable wheels the rent is as cheap or cheaper than at the worse. Some of the worst are small places in which a master has his work done on his own premises."

38. —— Tingle, fork maker and grinder, states (a. 58, page 13),—

"There is no fan. Landlords and owners of wheels ought to put them down for us. It is a very trifling expense. One might be put and fitted for all the troughs in here for 5*l.* They are put in some places, but some boys are put to grind in little chambers as dusty as possible."

39. Charles Tingle states (a. 59),—

"There ought to be a fan. If there were we should have to pay for it. They are all prices, from 30*s.* upwards. At some wheels the landlords put them up and charge for them with the trough. The rent for my trough with places for myself and a boy is 3*s.* 3*d.* a week, and we find our own candles, &c.

"All this dust in my trough is come since last Saturday. People fetch it away every week to mix with lime for mortar,as it sets so hard. Had this stone new five weeks ago, but it is worn so low that I shall want a new on Saturday. Have to chip it several times a day to make it bite."

Instances of successful use.

40. In the three needle and hackle-pin manufactures, about 10 miles from Sheffield, it appears that the "arrangements made to guard the workers from the deadly effects" of the steel dust by the use of the fan are very good (a. 66). Of these fans Mr. Joseph R. Cocke, hackle-pin manufacturer, thus speaks (a. 74),—

"A brother of mine invented the fans now used for pointers. They are now used by Government for different purposes, such as pumping air into ships. It is a very considerable expense to us. The one which we use for our 10 pointers cost, with the apparatus complete, 100*l.*, and besides this it takes three horse-power every day to drive it. It drives the air through a tube of some inches square at the rate of six miles a minute. I never calculated how much dust it carries off in a day, but 20 lbs. weight of steel with the average kind of work would be ground down to 15 lbs., and in some cases to 14 lbs. The benefit to health is very marked. The men used to die at the age of from 32 to 48, and the oldest grinder to be found in the trade anywhere, I believe, was 40; now they are, I should say, decidedly as healthy as men in any indoor employment, *i.e.* those of them who began work since the fans were in use. Some others, who began before, are still liable to be affected by the work. The men themselves well know the value of the fan, and if it will not work, as through a strap being off or anything, they would not keep on two minutes, and I could not persuade them. Our grinders only work six hours a day."

41. Mr. Newbold also, one of the well-known firm of Messrs. Rodgers and Sons, thus speaks of the beneficial effects of the fan (a. 206).

"The fan has very much diminished the bad effects of this work, but often the men do not use it. It is in one part of the hull, and communicates with the separate trough by bands. Sometimes, however, from mere neglect a man will work without using it, and when asked why he does so will say, 'Oh, I did not know the band was off.'"

42. The great and reckless destruction of human life in this occupation, and the attendant amount of human suffering and national loss, having thus been frequently brought before the public by independent and impartial inquirers, during the last 35 years, and the simple and inexpensive remedy in the use of the fan having been demonstrated by experience to be effectual, and acknowledged to be so by the persons most nearly concerned, the only question remaining for consideration is whether this is a case in which the Legislature would be justified in interposing its authority and requiring that to be done for the benefit of the public and of every individual in the trade, which individuals themselves are unable to effect. We have no hesitation in arriving at the conclusion that this is eminently such a case, and that in placing the metal trades of Sheffield under the Factory Acts Extension Act, a special power might with the greatest propriety be given to the inspectors of factories in reference to this particular object.

Use of the fan should be made compulsory.

Sanitary measures under the 4th section of Factories Acts Extension Act.

43. The Sanitary Measures already made obligatory in the occupiers of factories coming under the Factory Acts Extension Act, are by s. 4., as follows:

"Every factory to which this Act applies shall be kept in a healthy state, and be ventilated in such a manner as to render harmless so far as is practicable any gases, dust, or other impurities generated in the process of manufacture that may be injurious to health."

Proposed addition to that section.

44. The following addition to this requirement would meet this case.

(*a.*) Every factory in which dust is given off in the processes of grinding, cutting, glazing, or polishing any article of steel, iron, bone, ivory, or wood, or in the "razing" or "hacking" of the grindstones used in such processes, shall be provided with a fan or fans or other mechanical means by which the said dust shall be carried away in such a manner as shall, so far as is practicable, prevent its being injurious to any person working in such factory.

(*b.*) The occupier of any such factory may deduct from the wages of any person working in a room in which such fan or other mechanical means shall be provided any sum not exceeding one penny per week as payment for the cost of providing such fan or other mechanical means, and of keeping such fan in movement when necessary.

45. The word "injurious" is used in the above clause (*a.*) instead of the term "injurious to health" in clause 4 of the Factory Acts Extension Act, because in addition to the injury to health produced by the dust, small particles of hot steel are frequently given off with the dust in the process of grinding, which penetrate the workman's eyes, and cause great pain and inconvenience and even loss of sight (A. 94). The term "mechanical means" included also in the above clause (*a.*) would comprise such means as it might be practicable to adopt to prevent such causes of injury, as also the means of keeping the spray (with which even much dry dust is also included) from the workman during the process of wet-grinding (A. 55). And that the duty should be placed upon the occupier, and the power given him to indemnify himself for the cost of putting up the fan, and keeping it in movement when required, and of providing any other mechanical means which would tend to prevent injury to the workpeople, is plain from the facts mentioned in the evidence, namely, that it is beyond the power of the work people to adopt these measures effectually for themselves, inasmuch as it often happens that the desire of the most intelligent among them to protect themselves by these contrivances is frustrated by the unwillingness of others in the same room to adopt the same precautions (A. 43, 119).

46. Some occupiers of grinding factories already put up fans and "charge for them with the trough" (a. 59).

State of the places of work. Sanitary Regulations of the Factory Acts Extension Act necessary.

47. The state of the places of work in regard to ventilation and cleanliness, as described by Mr. White (A. 36–46), amply proves that the general provisions of the Sanitary Regulations of the Factory Acts Extension Act are as much needed in the case of the metal manufactures of Sheffield as we have shown them in our third Report to be in those of Birmingham and Wolverhampton. Although in the manufactories in the town, as distinguished from those of the country round Sheffield, it seems difficult to provide for effectual ventilation, owing to the confined space and defective arrangements of the buildings, the need is evident, in the interests of the health of the persons working in such confined spaces, that the occupiers should be called upon, in the words of the 4th Section of that Act, to keep every factory "in a cleanly state, and ventilate it in "such a manner as to render harmless, as far as practicable, any gases, dust, or other "impurities generated in the process of manufacture that may be injurious to health."

48. It is to be observed that the endeavour to remove dust and render it harmless by ordinary ventilation, as defined in that section, is a distinct operation from those that have been adverted to above in ss. 26 to 44, having for their object the carrying away the dust or other injurious matter from before the mouths of the workpeople by mechanical contrivances directed to that especial purpose.

Fencing machinery.

49. The necessity for the powers of the Factories Acts in regard to the fencing of exposed machinery is abundantly shown in the evidence relating to the Trades and Manufactures of Sheffield (A. 88, 89). And it appears requisite to extend those powers to meet a particular case of danger incident to the grinding occupations of Sheffield and other places where similar processes are carried on.

50. The powers of the present Acts in regard to dangerous machinery and accidents are confined to three special subjects: to the "securely fencing" of machinery; to preventing any child, young person, or woman from "cleaning any mill-gearing while in "motion;" and the providing for "sufficient means for protecting persons under 18 and "women from being wetted, where the wet-spinning of flax, hemp, jute, or tow is "carried on," . . . . "and where hot water is used for preventing the escape of steam "into the room."

51. In the processes of grinding in these trades, Mr. White states (A. 92).

> "A source of danger peculiar to grinders arises from the flying of stones. An accident from this cause is likely to be most serious, though wonderful escapes happen. A stone flies either from some flaw in itself, or from the faulty way of fixing it on the axle, or from the too great speed of the machinery. Careful inspection and testing before use will do much to guard against risk from flaws in the stones; though it cannot in all cases ensure safety, as the flaw may be far inside and beyond the reach of testing. Fixing the stones on their axle by means of iron plates, which give strength to the centre of the stone, instead of on the old plan, which is still often practised, of using wooden wedges, which are liable to swell from moisture or from the heating of the iron, is admitted to be a great security, and there is no reason why it should not be universally adopted, at least for large stones, in which the danger is greatest. One man has had 10 stones break, besides several narrow escapes from stones near (a. 47).

52. It would appear that there could be no objection to adding to the existing provisions, stated above in s. 50, one which should provide against this particular source of

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danger by requiring that the grindstones used in these branches of manufacture 'shall be 'fixed on their axles by means of iron plates.'

Strong case for extending the protection of the Factory Acts to the young in these branches of manufacture at Sheffield.

53. Mr. White's report generally, and those divisions of it in particular which relate to the "ages at which children and young persons are employed (A. p. 2. I.), to the "hours of work" (A. p. 5. VII.), to "night work" (A. p. 7. VIII.), to the "influence of the employment on their physical "condition" (A. p. 9. XIV.), make it abundantly plain that the protection of those clauses of the Factory Acts which deal with the hours of labour and education are eminently required in relation to the trades and manufactures of Sheffield.

Ages at which children and young persons are employed.

54. Children begin to work in these employments at about 9 or 10 years of age, and "from this age upwards they are employed whenever light work, and in some case work "which is not light, can be found for them" (A. 21).

"It is common for children to enter upon one of the deadliest occupations known, viz., fork grinding, as young as 9; most begin at or before the age of 10; some as young as 8 or 7" (A. 22). Mr. White adds that "he found a child of six years old at a wheel where he had worked for some months at other dry grinding for his father." (*Ibid.*)

55. Even in the large iron and steel works, where systematic night-work is carried on, Mr. White found a few instances of boys of very tender age. In one there were two boys who came there, one at 7 the other at 8 years of age, another a boy of 8, in another a boy of 7 (A. 23), the night-work alternating by weeks, with day-work, in periods of 12 hours each (A. 22). But the common age for beginning in such works is from 10 to 12 (A. 22).

56. The employment in which most of the young children are found is cutlery. "Girls "as well as boys sometimes begin this at 7 and even 6 years old," and one boy whom Mr. White found at work had begun at 5. A woman who began cutlery herself at 6 years old, "put her own lass, now dead, on at three weeks turned 6." "In most cases," says Mr. White, "the youngest children are employed by their own parents or relations; "often in consequence of the intemperate or improvident habits of their parents" (A. 25).

Hours of work.

57. The hours of work where steam power is supplied do not appear to be often excessive. Where water power is used, time lost for want of water is apt to be made up by long hours when water is abundant. "One boy, a fork grinder, works "many times 15 hours a day." But when the work is independent of steam power, as is still the case to a considerable extent (A. 11), factories are open 14, 15, and even 16 hours a day (A. 66), and in such cases, in the employments especially of iron and brass founding, cutlery, metal rolling, &c., children and young people are kept late to help the adults (A. 67). Of the amount of this overwork in different occupations Mr. White proceeds to give a summary collected from the evidence that came before him, and forcibly indeed does it "show the existence of an amount of "overwork of young boys which is truly fearful" (A. 76).

58. It is impossible for any mind to realize the amount of work described in the following passages as being performed by boys of from 9 to 12 years of age, in, generally speaking, a very high temperature, often in very close and ill-ventilated rooms, inhaling in a large proportion of instances the deadly dust thrown off by the processes of grinding, and in operations connected with it, without coming irresistibly to the conclusion that such abuses of the power of parents and of employers can no longer be allowed to exist. Mr. White states (A. 73-75):—

An indirect evil of night relays to boys.

> "The practice of boys working at all by day and night turns, either in the usual course of things or at pressing times, seems inevitably to open the door to their not unfrequently working unduly long hours. These hours are indeed, in *some cases, not only cruelly but even incredibly long for children.* Amongst a number of boys it will of course not unfrequently happen that one or more are from some cause absent. When this happens their place is made up by one or more boys, who work in the other turn. That this is a well understood system, is plain, not only from the statements of boys themselves, nearly all of whom, if questioned on the point, state that they have done so, but perhaps still more clearly from the answer of the manager of some large rolling mills, who, when I asked him how the place of boys absent from their turn was made up, answered 'I dare say, sir, you know that as well as I do,' and admitted the fact."

Excessive overwork for boys.

> "But not only in this way, but also in places in which night-work is not part of the system, an excessive amount of overtime is not unfrequently thrown upon young boys, *e.g.*, a quarter of a day, a half, or even a whole period of 12 hours in the 24. This is especially the case in steel and iron rolling of the lighter kinds, *e.g.*, for crinoline and wire."

Instances.

> "*A boy 9 years old, or at most* 10, worked at crinoline steel rolling *three nights running as well as the days, and this under his own father.* 'We should have gone so (*i.e.*, nights as well days) to the end of 'the week, only the engine broke down.' (a. 79.) His case and the appeals which he repeatedly made to me whether he might not 'go to school a bit longer, instead of working, struck me as peculiarly painful."

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"Another, *now* 11, who went at 9 years old to hardening and tempering crinoline steel, worked there *from 7 a.m. till 9½ p.m. four nights a week* 'for many and many a month,' '*many a time till 12 at night*,' and either once or twice worked *from 7 in the morning all through the next night and day, 'and on till 12 the following night*.' I had to live very badly, and if I had no dinner, he (the man) always gave me a bit. (a. 149.)"

"Another boy at a rolling mill, where his proper hours were from 6 a.m. to 5½ p.m., worked about 4 *nights every week till* 8½ *p.m.* at least, and this for six months out of the nine that he was there, there being day and night relays in the remaining three months, and for about *four months he worked one day and night together* every week, and sometimes two days and two nights running. (a. 101.)"

"Another, *at 9 years old*, sometimes made *three twelve-hour shifts running*, and *when* 10 has made *two days and two nights running*. (a. 143.)"

"Another, now 13, at a former place *worked all night some Fridays* and other nights except Mondays always till 8 or 9 p.m. (a. 85.)"

"Another, *now* 10, at a former place worked *from* 6 *a.m. till* 12 *p.m. three nights*, and till 9 *p.m. the other nights*, in his only week there. (a. 220.)"

"Another, now 14, has worked sometimes from 6 a.m. on Friday till 2 p.m. on Saturday. (a. 110.)"

"Another, now 13, at a former place worked from 6 *p.m. till* 12 *noon next day for a week together*, and *sometimes for three shifts together, e.g., from Monday morning till Tuesday night*. (a. 111.)"

"Another, now 12, has worked in an iron foundry at Stavely from 6 a.m. till 12 p.m. for a fortnight on end; could not do it any more. (a. 169), &c."

59. To these may be added the following instances of excessive over-work in the case of young boys, the first instance being, it is to be hoped, an exceptional case as regards showing what a father may be capable of (a. 115, 116).

"George Allinsworth, *age* 9. Came here as cellar-boy last Friday. Next morning we had to *begin at* 3, so I stopped here all night. *Live five miles* off. Slept on the floor of the furnace over-head, with an apron under me and a bit of a jacket over me. The two other days I have been here at 6 a.m. Aye! it *is* hot in here."

"*Before I came here I was nearly a year at the same work at some works in the country*,—a very large place. *Began there, too, at* 3 *on Saturday mornings*—always did, but was very gain home, and could sleep at home. Other days I began at 6 in the morning, and gi'en over *at* 6 *or* 7 in the evening, but it depends. Saturday afternoon I give over at 2 or 3. Go up into the furnace and carry away the waste after they have done teeming."

John Allinsworth, father of last boy.

"Work in the furnace. Last Saturday morning we began work at 2. We had slept in the furnace, being strangers to the town. We live at Wadsley, 4 *or* 5 *miles* off. We have to be here by 6 a.m. It is a long way for the boy to come and go back each day, though I can manage it. I should like to get some place in the town for him to stay in."

60. Also as to the bad effects of using heavy hammers at a very early age (a. 121.), and the following, (a. 128.):

"There is a good deal of heavy work. I have seen a boy of 14 years old using a 22 lb. hammer in file-forging, and some who have grown completely out of form from the work."

61. Women also are found to work at night (a. 187, 188, 189, 193). A woman who worked in a shop remarked "We have worked hard all night "many a night" (a. 130).

62. Upon the amount of overwork above described, Mr. White appropriately remarks that—"No wonder that boys sometimes fall asleep at their work, stumble, fall when the metal flooring gets 'hot and slippy,' and work is pressing, get burned or pierced with red-hot iron or steel, or otherwise suffer for their supposed negligence."

63. Other incidents of night-work pressing hard upon the boys are described in the following paragraphs (A. 80, 81).

"It may happen that a boy is kept always on the night shift, instead of working in the day shift, as others do."

"The night-work presses hardest on the boys on Monday. Having been to bed on Sunday night, they, cannot lie in bed on Monday, so I am up for 24 hours running.' It is very seldom as ever I do go to bed on Monday then" (a. 167). It also seems but natural, as a steel manufacturer who employs boys in night-work states, that boys who work at night at all "cannot sleep and get proper rest by day, but will be running about" (a. 109). On the other hand the night relays get the advantage of only working five shifts a week" (a. 167).

Overtime not profitable to the employer.

64. We have given in our previous reports the statement of several experienced manufacturers to the effect that over-hours are not, in the long run, profitable to the employer, while they certainly tend prematurely to exhaust the working power of the men, and also morally injurious both to old and young (1st Report, ss. 169, 376–386, 580–584; 2nd Report, s. 369; 3rd Report, ss. 64, 205). The following statement upon this subject by Mr. Guest (a. 247) is very worthy of consideration.

"Our day is from 6 a.m. till 6 p.m., with an hour and a half for meals. On Saturday all leave at 1 p.m. We were the first in this neighbourhood to introduce the short day on Saturday, about 18 years ago. The time so given is, I believe, spent rationally and well, *e.g.*, by many men in their gardens. The amount of work done in the week, instead of being diminished by the loss of time, is, I believe, increased by the rest which is given; at any rate, the best proof of the half-holiday answering is that nearly all the other large works in the town have adopted it.

"We should have no objection to a law limiting the work of children and young persons to our present hours. If more work were needed in a given time we should simply increase the number of our hands; our premises are large and roomy, and would easily admit of our doing so.

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"The question of confining children to half-time scarcely concerns us practically. For so small a number it might not be worth while for us to make arrangements for half-time at all; but we should not look at this merely as it affects ourselves. We consider that, as employers, we have duties as well as interests, and what the children ought to have we should wish to give them; we should be glad to do anything for their good.

"We insist on the hands coming punctually to work, and on Mondays just as much as on other days, and we also require sobriety and steadiness. We find that when a good system is once started it works easily and well. Our men are a sober, intelligent set, and such as take a lead in clubs, &c. In 20 years we have scarcely had a case of a man of ours being taken up for drunkenness."

"It is possible, however, that other employers in our branch of business might feel difficulties which we should not from any legislative restrictions on labour. While we employ only a dozen or fifteen children, other manufacturers, making just the same description of work, would probably employ a much larger proportion, perhaps four times the number. A want of room or other causes might be an obstacle to putting on extra hands when needed.

"Though we occasionally make over-time we have never real night-work, and I should be very unwilling to have it. Where it prevails, as in some manufactures it does, and no doubt necessarily, its moral effect on the boys engaged in it is very disastrous. In any work in which young children can be employed, the wages which they can earn, however small, are sufficient to make too many parents take them from school much too soon."

66. The evidence also of Messrs. Harrison and Deakin (a. 201), and of Mr. H. Wilkinson (a. 223), is very instructive upon the same points.

Boys should not be allowed to begin as grinders until the age of 11.

67. To whatever extent measures of precaution may be adopted, by means of fans or other mechanical contrivances, and by the improved ventilation and cleanliness of the places of work, to diminish the causes of premature decay and death among those employed in the occupation of grinders, there will still remain the injurious result produced upon the growth of the young, and their bodily health, by the confined position and disadvantageous posture in which the work of a grinder is performed. In all cases the position of the grinder is that of "a greater or less degree of stooping "over different kinds of work" (A. 47).

"In most of the work he sits astride on a broad flat-topped horsing, too broad for young boys. One of the average kind which I measured was 14 inches wide. The body is sometimes thrown forward almost horizontally, but more often curved forward with the head down, and most so where the stone or wheel is small, the work to which the youngest boys are first set." (A. 48).

68. The result is that the growth of many of these grinders "appears stunted, and "their bodies weakly," and in some cases "the body becomes misshapen" (A. 106). "For these reasons many consider that a boy should not be allowed to begin grinding "till the age of 12 or 14." (A. 104).

69. Upon this Mr. White gives his opinion as follows:—

"Allowing for the objection which may occur to some, that this opinion may be in some degree influenced by the wish common in many trades to keep up wages by preventing too great a supply of labour, I believe that the conviction that the work is unsuitable for young boys is sincere. It is expressed by most respectable men, and these as a rule do not take their own or other people's children to work for them under the age of 12 or 13." (A. 104.)

70. Parliament has already sanctioned by s. 6. (5) of the Factory Acts Extension Act the excluding of boys from the work of fustian cutting until the age of 11, upon the precisely similar ground of the injury permanently caused to the growth and bodily health by the position of the fustian cutter.

71. We are of opinion that the same age of 11 may with propriety be adopted in the case of the grinders. The medical opinions referred to by us in the case of the fustian cutters showed that by that age the bones of the human frame were sufficiently consolidated to render distortion from work in an awkward position less probable; and it may reasonably be anticipated that the precautionary measures which may be sanctioned by Parliament, with a view to the removal of dust and the amelioration of the general sanitary conditions of the places of work in the case of the grinders, will contribute, with the age above designated as the one for beginning to work at that occupation, to make it a far less injurious employment both to young and old.

Need for the education clauses of the Factory Acts at Sheffield.

72. Although the moral condition of the young at Sheffield, and the means of education at their command, are described by Mr. White as having improved since the inquiry of Mr. Jelinger Symons in 1841, yet the facts which abound throughout the evidence recorded by Mr. White, show painfully the very great need still existing for extending to the children under 13 at work in the various trades and manufactures of Sheffield, the benevolent and useful provisions for education embodied in the Factory Acts.

73. Mr. White states (A. 109.) that although he made less full inquiry into the state of education than he had done elsewhere, and especially at Birmingham, as exhibited in our Third Report, it was sufficient to show it to be very defective:—

"The proportion who have not ever attended day schools, or done so to any apparent profit, is decidedly large, considering the comparative smallness of the demand for young children's work; and there appears also to be great neglect of attendance at Sunday schools and places of religious

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worship." * * * "Numbers of boys, some of considerable age, are unable to read or do more than tell the letters, if that; and in most cases where I made inquiry on such points, I found ignorance of simple facts of religion or secular life as great as I have found elsewhere. Some table-knife hafters compute that probably a third of the adults in that trade cannot read or write. In a manufacturing country parish, out of about 1,000 persons who signed a petition a few years ago for the Sunday closing of beer houses, about 700, including a schoolmistress, made their mark." (A. 111.)

74. The following are some of the many instances given in the evidence which betray the same lamentable amount of ignorance which Mr. White brought to notice as existing at Birmingham among children of the same age engaged in similar branches of manufacture, and which is well calculated to excite pain and surprise of no ordinary kind:—

Henry Stow, aged 14. (a. 82.)

"Went to work at shears at a cutlery manufactory when going 7 years old.

"Can read a bit, but not write at all. Don't know of London, or Queen Victoria, or if she is a woman or takes care of the country."

John Holmes, age 13. (a. 85.)

"Know most of my letters. Had to go to day-school till father began to be bad, and go always on Sunday and to church. There is no night school about our house now, but there is at winter when its frosty, and there's snow on the ground, and I go then and pay 6*d.* a week. (Is asked of Queen Victoria.) Have heard the name on it; can't tell what it means. She finds 'em money. The Bible is the Holy Bible. Have not heard of the Testament, Gospel, Adam, or Jesus Christ. An angel is an image."

John Morris, age 14. (a. 96.)

"Get 8*s.* 6*d.* a week, and have 6*d.* of it for myself. For nearly a year have put 4*d.* out of this into the bank. Generally do shiver like this when I've been hot."

"Do not go to school on Sunday or at night; have no good clothes to go in. Father makes 18*s.* a week, one of my brothers 10*s.*, and I have three sisters at work. Three of us are at home too little to work. Go to a church. (Qy. what church?) some say its protestant, some catholic. Parson preaches out of a pulpit and reads out of a bible, but I can't get nigh enough to understand the words. Have heard say that God made the world, and that all the people were drownded but one; heard say that one was a little bird. Suppose that Christ was a man. He was a father and teached em to read out of a Bible. Think he was put to a cross."

William Smith, age 15, moulder. (a, 97.)

"Never was at day-school in my life, except for a week or two, and do not ever go at night, but do on Sunday, and to chapel. My cousin teaches me reading a little. Heard at chapel about Samuel fighting with a lot of soldiers. Have not heard of Paradise. The garden of Eden is where men goes and eats off a tree. It was not any particular man. Do not know if Adam and Eve were the first people in the world. God made man; man made woman."

Edward Taylor, age 15. (a, 101.)

"Go to school on Sunday and three nights a week, for which I pay 1½*d.* Can read, write, and do sums, *e.g.*, reduction. Do not know what 10 times 12, or 3 times 7 is. Have almost forgot 'em all. Do not know of London; never learned any maps."

Jeremiah Haynes, age 12. (a, 143.)

"Cannot read. Ran away from school to get work, but would rather go to school now to get to learn to read. Cannot tell "reading" letters such as those (*i.e.* my writing, J. E. W.), but can tell those in a book. Go to school always on Sundays. Have not heard of Abraham or the Gospel. The Bible tells us what to do and sich. There are somewhere about 30 pennies in a half-crown; am not sure; think about 32. Four times four is 8; 4 fours are 16. A King is him that has all the money and gold. We have a King (told it is a Queen), they call her the Princess Alexandra. (Told that she married the Queen's son.) The Queen's son is the Princess Alexandra. A Princess is a man."

Wm. Turner, age 12. (a, 194.)

"Don't know anything about the Queen or England. Don't live in England. Think it *is* a country, but didn't know before. There are six days in a week. There is another day; altogether it makes (*after a long pause*) seven days."

Henry Matthewman, age 17. (a, 207.

"Can tell the letters but not read. Was at day school from as long as I can remember, till 12 years old, when I came here. Missed going sometimes, but have gone several days and a month, and never miss. Have been to a Sunday school once or twice since, not more. Have been to chapel, but have missed a good many times lately. One name that they preached about was Jesus Christ, but I cannot say any others, and I cannot tell anything about Him. He was not killed but died like other people. He was not the same as other people in some ways, because he was religious in some ways, and others isn't. He was alive again, but I cannot say if he is now. He was on a cross, but that is not how he was killed."

75. A very serious consequence of the defective state of education in Sheffield is showing itself in the contracted views of large numbers of the work people in regard to the introduction of machinery. Files in the Sheffield district are still made by hand labour only. Machinery has lately been adopted for that purpose near Manchester. (A. 12. See also our third report, App., p. 177, s. 128.) In France "excellent-looking "files are produced in that way," and the French are selling large quantities of files "to Sheffield customers on the continent, almost "equal in appearance" to those of Sheffield, and at little more than half the price. It is anticipated that the gradual improvement in skill and knowledge in the French workmen will enable them to bring

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their work up to an equality with that of Sheffield; and "it is obvious" that the interests of the English trade "must in the end suffer if the work can be done, as it "can, at a much lower cost in other countries by the use of machinery" (a 126). "The same difficulty prevents the introduction of machinery in other branches of our "trade. The Americans have machinery for saw grinding which produces beautiful "work at a third of the cost here; and one of us has been in a manufactory "there where this was done" (ibid).

Factory Act should be introduced gradually in regard to youths between 14 and 18.

76. In determining whether the limitation of the hours of work for the young, in accordance with the regulations of the Factory Acts, can, with propriety, be applied to the metal manufacturers of Sheffield, the only question on which much difference of opinion is expressed by employers relates to the age up to which youths should be excluded from working at night, in cases where night work by relays is practised.

77. This, Mr. White states, is practised in some branches of iron and steel work which employ boys as part of the regular system. In other steel works, where the work is of precisely the same kind, it is practiced only when trade is good; "thus showing "conclusively that, in several branches at least, the "night-work of boys which prevails "is not essential." (A. 78. See also a. 106.)

78. The following are illustrations of the opinions prevailing among the employers on this subject.

79. Messrs. Naylor and Vickers, steel manufacturers, who employ between 600 and 700 persons, among whom only 10 per cent. are under 18, and of those only 20 boys under 18 work in the night sets, thus express themselves (a. 84.):—

"We prefer not to employ lads under 14, but to oblige our workmen we sometimes take them younger, though not younger than 11. *Only* 10 *per cent.* or so of all the persons employed, who are all men or boys, are *under the age of* 18. The boys work chiefly in the rolling mills at the back of the rollers, others at the forges, carrying away bars, and others, about 15, including five of the youngest, in the cellars of the melting furnaces. Their work is to watch when the pots run, which is the way in which boys are employed generally in the town in steel smelting. They do not suffer from the heat. The temperature is probably from 86° to 90°. The remainder are engaged in moulding, pot work, lathes, and turning, or in the warehouse as errand boys, &c., and two or three at joiners' and masons' work. *At the forges and in the rolling mills the hands work day and night in relays*, but all the other parts of the work are day work, *i.e.*, from 6 a.m. to 6 p.m. In the forge the hours are from 12 till 12. *Some of the hands always work in the night without any alternation of day and night work.* These arrangements of ours are made by the men according to their own choice. We do not find any difference in the health or work of those who work regularly by night and those who work by day, and probably people can sleep better if they have the same period of rest than if it is changed. The melters have to do three rounds of melting in a day. If it takes more than the regular time, they have to stay to finish, but they often get away in less than the 12 hours. We do not like the men to be actually engaged in work in any branch for more than 10 hours. It is not so good for them, and not economical to the employers. *About* 20 *of the boys under the age of* 18 *work in the night sets.* About a dozen of the boys are in the employment of the men, not of us; but it is understood that they are equally under our control, and it is the duty of the foreman to look after them. We could not *well do* without lads under 18 working by night. The objection would be the increase in the cost of production; but if the age were fixed *a year or two lower*, there would probably be no difficulty. It could be arranged by merely putting the younger into day sets. Skilled hands, and the heads in very department, are difficult to get, but of lads we could get any number. Boys under 13 get perhaps from 5*s.* to 6*s.* a week, and from 14 to 16 perhaps 7*s.*, though in work at which boys are apprenticed they get rather more. A smartish lad of 18 or 20 at the rollers will get 3*s.* a day. It is after the age of 16 that a limitation of boys' work would begin to make a difficulty as to wages. We pay one price to all below that age, according to their work, without regard to age. But from the small proportion of boys that we employ, the subject (*i.e.*, of restrictions on night work), is *of little importance* or interest to us."

80. Mr. J. Ellis, one of the firm of Messrs. John Brown & Co., steel and iron works, employing about 3,000 men and boys, part of whose operations, namely, "iron and "heavier steel work goes on night and day by relays," states that "in the heavier steel "work one or two boys are employed to a score or two men." They have "upwards "of 500 boys in their employment under the age of 18, and of these about 170, or one-"third, are under the age of 13" (a. 91). Mr. Ellis's opinion as to the exclusion of boys under 18 from working in the night relays is as follows (ibid.):—

"I do not think that it would be very objectionable to require that no person under the age of 18 should under any circumstances work more than 12 hours in the 24. But we do not think that any line could be drawn over the age of 12 at which boys could be dispensed with for night work. But we would sooner be prevented from employing boys under the age of 13, or even as high as 14, at all, than not be allowed to employ boys that we do have at night. Those boys who work in the day sets must take their turn in the night sets also, because men could not work in the night sets only; it would ruin their health. In summer, however, they might perhaps have the best of it, as the heat in the day then is very great. We insist on their changing their set week by week. We have sometimes made exceptions, letting men undertake the night turn of others who were being hurt by it, but we have always found these men giving way in health from the night-work without change. We think, however, that night-work in alternate weeks is no harm. We find the men who do it as well as the others who do other work only by day. We like also, for convenience of the workers, to keep the same sets working together, as the food of a family can then be sent at the same time, and altogether it suits their home arrangements better.

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"Our objections to not allowing boys under 18 to work at night would be on account of the increase of expense, but this is the only reason. We think that the increase would be more than the trade, having due regard to its being successfully carried out, could fairly bear. Labour is scarce here, and might fall short if there were such a regulation. Still this might settle itself in time by workers being attracted from other districts."

81. The system therefore which Mr. Ellis would prefer would be not to be allowed to employ any boy under 13 or even 14 at all, and then to be allowed to employ boys of that age in the night sets on alternate weeks.

82. The Cyclops Steel and Iron Works of the Messrs. Cammell & Co., "are on a " like large scale" with those of the Messrs. John Brown & Co., and employ "between " 2,000 and 3,000 persons." The nature of the employment and the system of work are, Mr. White states, the same, and "a statement was made by the managing director " to much the same effect as that made on behalf of the Messrs. Brown & Co.," but cannot be inserted, as the manuscript sent to the manager for revision was not returned. Mr. White, however, mentions that in answering one of the questions of our tabular forms as to the prohibition of night-work for children and young persons (the answer being that it would be "impossible to do so, it would be tantamount to stopping our works,") the fact nevertheless appears from their return of the whole number of persons employed that "boys of all ages under 18 form little more than 6 per cent., and boys under 13 " less than 1 per cent., and of both these classes several would naturally be engaged in " day work only" (a. 98).

83. It may safely therefore be concluded that in the case of these works at least the limitation of hours for youths under 18 in accordance with the Factory Act would be of no material importance.

84. Mr. Joseph Peace, of the firm of Messrs. Joseph Peace & Co., steel and saw manufacturers, who "melt, tilt, and roll steel, and make saws, busks, for stiffening, and " other articles," states as follows (a. 109):—

"If boys under 18 could not work at night men must be employed instead, and we must charge more for that, so that things could not be sold to the consumer so cheap. That would be all. The manufacturers being all on the same footing by law would keep the prices up, much as at present the men keep their prices up with us by means of their union. The difference of price would not, I think, be sufficient to discourage the trade. Youths do not usually get full men's wages till about 21.

"Perhaps boys over 14 might be allowed to work at night, but not any younger. But on the whole I think that it must be injurious for any boys to be working at night. They cannot sleep and get proper rest by day, but will be running about. It has sometimes happened that the mill has stood, *i.e.*, been unable to work simply because boys belonging to one set have been away. If the want of workers is discovered in time it may happen that others are stopped out of the preceding set and persuaded to make the other up, but usually they are away too soon. It may happen sometimes that boys are thus kept without our knowledge."

85. On the same subject, on the other hand, Mr. E. F. Sanderson, of the firm of Messrs. Sanderson, Bros. & Co., Steel Rolling Mills and Forges, Attercliffe, states:—

"Great difficulty would be caused by preventing boys under 18 from working at night. The chief would be the increase of cost from employing men instead of boys. I cannot say what this would be, but probably it would not be enough to enable the manufacturers to raise the price of steel, and consequently it would fall on them, as of course the men would refuse to pay it. Only five of the boys here are under 13. The wages being paid by the men who work by the piece, I cannot say just what they are. Perhaps the younger boys get from 4*s*. to 5*s*. a week, and the elder rise from that up to 15*s*. or 16*s*. Probably youths of 18 could be got now for 17*s*. or 18*s*.; but if all the works in the town had to get youths of that age the available number probably would not be sufficient. The boys' work is of a kind for which the strength of boys is generally quite sufficient, and consequently there would be no gain in the greater strength of the men to counterbalance the loss, or it would be only in the few cases in which the metal is heavy. The men would not like so well not to have boys under them, as men would be less obedient. Besides boys must begin young to learn the trade. Leaving day-work alone open to boys would not answer this purpose, as owing to the men working days and nights in alternate weeks, the men would be separated half the time from their boys, and would thus lose half the profit which they make from them. The training which they give to an apprentice is considered as part of the return for the boy's labour, and thus enables the men to get it at a cheaper rate. Each man would want half of this profit. In addition to this it would throw regular night-work on those who worked instead of boys in the other turn, which they would not stand. The difficulties, in fact, would be so great that they would very likely lead to giving up night-work altogether. As far as the work itself is concerned this would suit as well, but then there would be the loss from so much expensive machinery lying idle half the time, and to get through the amount of work which we are able to do on the present system we should have to double our premises and plant, which would double the outlay. It is true that there is this loss from machinery lying idle in those manufactures in which work now only goes on by day. But the use of furnaces would involve a further loss in our case. If these were kept up there would be a waste of fuel, and if they were not there would be loss of time in laying the fires and getting the heat up, and the furnaces themselves would suffer from the changes of temperature. The larger the furnace the greater the loss.

METAL TRADES OF SHEFFIELD.

In the rolling-mills the furnaces are larger than in the forges, and are never let out even on Sunday, or if the works stand for some days. The smaller furnaces in the forges are let out on Sundays. The melting furnaces are also let out each night, but this is necessary to clear the bottoms, and the pots, if put fresh into a furnace already at full heat, would be liable to be spoiled. As it is, the furnaces do not get cool in the night, and the pots are gently warmed before putting them in the first time, each pot serving for the day of three rounds."

86. Mr. J. Taylor, assistant-manager of the Park Gate Iron Works, Rotherham, employing about 1,300 persons, gave the following opinion (a. 164):—

"A prohibition of night-work by boys would increase the cost of labour considerably in those departments in which they chiefly work, *e.g.*, rolling. I cannot say whether these items would be sufficient to raise the entire cost of the articles produced enough to injure the trade, if all works were under one law. It would not do to allow the younger boys to work by day, as this would throw constant night-work on others in the alternate shift, and this would not suit their health. I cannot say up to what age boys could be spared from the night-work, but I will put it thus, viz., that it would do boys of from 12 to 15 years of age less harm to work in the night-shift in alternate weeks, on the present plan, than it would do boys of from 15 to 17 to work always in the night-shift.

87. In estimating the injurious consequences of night-work upon the constitution of the young and upon their habits and morals, an element is pointed out by a writer on "health," which appears to deserve much weight, namely, the importance of light in maintaining the bodily frame in proper vigour. The following extract is given by Mr. White (a. 282):—

"Light also acts upon the tissues of the body directly in hardening them and supporting their elasticity. The muscles of animals, when they are deprived of a proper amount of light, become soft and inelastic, the nervous power loses its tone from defective stimulation, and the elaboration of all growth seems to be perverted." * * * "In the case of children, constant access to plenty of light through the day, and to the direct rays of the sun for a part of it, is most essential to health. Light assists in the elaboration of good plastic blood out of the food, and hardens the fibre after it has been laid down. It also acts as a stimulant upon the organs of sight, and by this means brings about more activity in the various celebral functions than would otherwise be the case." * *

"I have had opportunities formerly, when in Lancashire, of observing the effects of night-work upon factory children, and I have no hesitation in saying that, contrary to what some employers were fond of asserting, those children who were subjected to it soon suffered in their health, as I, then attached to a dispensary, had abundant evidence of it."

88. The evidence of manufacturers in Sheffield quoted above is manifestly much influenced by the particular circumstances of each as regards the number of children and youths whom he employs in the night relays. It has been seen that the per-centage of youths under 18 employed in this manner is, in some of the largest works, very small, while in others although the precise proportions are not given, it may be taken to be more considerable. In the latter cases, the disarrangement, (though it may safely be inferred that it would be but temporary,) and the additional cost of labour which would follow a prohibition to employ young persons under 18 in night work, or in other words, beyond factory hours, naturally indisposes them to contemplate the adoption of such hours.

89. Nevertheless considering that the per-centage of boys under 18 employed in night-shifts is not great; that being so employed at all, exposes them to the liability to work double shifts, or in the words of Mr. White, (supra § 58,) "in some cases cruelly if not "incredibly late hours," (see also the opinion of Mr. Joseph Peace, supra § 84); and considering that in a manufacture requiring the utmost physical strength, it is of public importance that the physical powers of the operatives should not be prematurely undermined, we are of opinion that the evidence on the whole justifies the adoption of factory hours in this case; and we think that if the age of 18, as the one below which no young person should be employed otherwise than according to the regulations of the Factory Act, were arrived at by progressive stages of a year each from the time of the passing of the Act, a great proportion of the presumed difficulty would be obviated. It might be enacted that for the first year boys of 14 might be employed as at present; this would exclude from night work very few of those who are now employed regularly in night relays. The boys therefore of 14 being thus available at once, the exclusion of all under 18 would be very gradual, and it might reasonably be anticipated that by the end of the four years a sufficient number of youths of 18 would have been brought up in each work to enable the night relays to be carried on without difficulty or material increase of expense.

And when the provisions of the Factory Acts have fairly taken effect at Sheffield, it may be fully anticipated that the same judgement of their utility and benefit both to employers and work-people will be formed, as is expressed in the following paragraph by the medical officer of Barnsley (a. 263):—

"I am very glad that government is taking up this inquiry. The factory legislation has contributed wonderfully to the good feeling and contentment of the working classes; all like it now. Even masters and others who opposed it approve of it, and the working classes speak of it as 'our grand charter.' In this neighbourhood we have the means of judging. The change of feeling in this town since it

METAL TRADES OF SHEFFIELD.

MANUFACTURE OF HAIR SEATING.

was introduced, from one of political and social disquietude to one of order and contentment, is wonderful; no one not acquainted with the facts could conceive it.

Meal times, factory hours for, should be adopted in all cases except that of puddlers in iron works.

90. The Factory hours for meal times are required for and are applicable to all the branches of employment in the metal trades of Sheffield, as in the Birmingham and Wolverhampton districts, with the small exception named in s. 173 of our 3rd Report. In that section we recommend that the boys employed by the "puddlers" should be exempt from the factory hours for meal times, on the ground that their work is necessarily intermittent, and that they have several intervals of comparative rest during which they take their meals. The same principle applies to the iron works of Sheffield and elsewhere.

"The 'heats' (metal) must come out when they are ready, or they would be spoiled; and the boys must be there to help. *Any fixed times for meals* would cause great hindrance and loss. The heats could not be so arranged as to allow of any regularity. The quality of the iron may make a difference as to the time of heating; the shape into which it is put, a difference in the time of working; and hindrances may arise. That stopping of the engine just now for 20 minutes, owing to something wrong with the pump, would very likely be the cause of spoiling some iron. The boys, however, get *frequent intervals* of 20 minutes or perhaps half an hour between the heats and take their meals in these. Such an interval is seldom more than half an hour."

The law would be carried into effect even in the small shops and houses.

91. We have expressed our belief (ss. 192–196 and s. 465 C. of our 2nd Report, and s. 175 of our 3rd Report,) that children employed in any of these branches of manufacture at their own homes require protection, and that any legislative declarations in their favour would be enforced by the public opinion around them; also that those employed in the smaller factories and workshops are capable of being reached by protective legislation. The following paragraph leads to the same conclusion in regard to the Sheffield district.

"It is true that it would be less easy to carry out a law of this kind in small shops than in factories, and in factories such as those in Sheffield, where nearly all the children are employed by the adults, than in factories such as those in Lancashire. But we think that it might be done, not only in the factories, but even in the small shops and homes, say by putting on a small fine, which was the way that we enforced our rule; we do not think that it would be thought more hard in a case of working at home than in a factory. There are plenty of people here who would let it be known if the law was being broken. But if it were impossible to carry out such a law effectually in the small places, we do not think that this would be felt as an injury to those who work in other places. In one of the largest and best cutlery factories, where there is a rule that the works shall close at an early hour, the men never grumble because others can work longer elsewhere" (a. 201).

92. The number of small factories in Sheffield is still very great. They are thus described by Messrs. Harrison and Deakin, table-knife hafters (a. 201):—

"The work is carried on partly in large factories, partly in small factories and shops. House or garret work has been decreasing for the last 20 years, and is now almost gone. Men find that it answers better to work in places where they can have the advantage of power. The proportion however of those employed in large factories and those employed outside varies with the state of trade, the tendency of bad trade being to discourage large masters from keeping work-people regularly employed on their premises. Perhaps at the present time about half work in small shops up and down the town. But in many cases some of those who work in factories are really out-workers, working on their own account or for other masters. We should call a place a factory where as many as ten or a dozen work."

Warehouse work should be placed under the Act.

93. In any legislation in reference to the metal manufacturers of Sheffield it will be necessary also to include the warehouse work connected with it. Of this Mr. White remarks (a. 113) that "some of the warehouse work here, as in many other warehouses, "is strictly manufacturing."

Mr. Harrison states (a. 215)—

"The only females in our employment are perhaps 20, who are engaged in rubbing and wrapping goods"

Mr. Hutton states (a. 219)—

"There are several females in the warehouse, some engaged in wrapping up things, but most in polishing with the hand and rouge. Numbers of females are engaged in Sheffield in like manner. In cutlery work part of their work consists of whetting the blade on hones."

94. Much overtime occasionally occurs in them.

"Overtime happens chiefly in the warehouse where females are employed in rubbing, wrapping up, &c. It is sometimes till 9½ p.m. there" (a. 214).

The manufacture of hair seating should be placed under the Act.

95. The manufacture of hair seating, carried on at Sheffield in a factory employing above 300 persons, of whom all but eight are females, should be placed under the regulations of the Factory Act. The number of children employed at the time of Mr. White's visit was 25. The evidence (a. 268–271) shows a great deficiency of education among them. The proprietors of the factory, Messrs. Laycock, had established a school, but "it was given up owing to the difficulty of securing attendance" (a. 266). The hours of work, although not exceeding in number the factory hours, are nevertheless later, extending to 8 and 8½ p.m., which is in many obvious ways disadvantageous to young girls; and the meal hours are not always regular (a. 270).

NAIL AND NEEDLE MAKING.

FOUNDRIES, &c., IN WEST RIDING.

Nail making and needle making, &c. at Bromsgrove, Redditch, and Alcester.

96. The nail and needle manufacture carried on within the registration districts of Bromsgrove and Alcester was described by Dr. Greenhow, in his Report to the Medical Officer of the Privy Council (3rd Report, 1860). It is carried on in cottages, and also in small shops, the latter having usually four or five "stalls." Many women and children are employed, the latter generally beginning to work at nine or ten years of age. These frequently work very long and irregular hours, in consequence of the habit of the men to idle away the early part of the week. The use of the fan has been found very beneficial where introduced, in diminishing the destructive effect of the dust given off in the processes of pointing, polishing, and filing (p. 117), although much fine dust still escapes and is inhaled. Badly ventilated workrooms are also common. The regulation of the hours of labour, and supervision under the Factory Acts Extension Act, would lead to improvements in these respects, in the shops, that could not fail to be beneficial. The purely domestic work falls within the recommendations of s. 175 of our 3rd Report.

FOUNDRIES, MACHINE SHOPS, &c., IN LEEDS AND OTHER TOWNS IN THE WEST RIDING OF YORKSHIRE.

Arrangement of subjects.

97. Mr. Longe in his inquiries relative to the metal manufactures of South Staffordshire and other parts of the kingdom (Third Report, pp. i.–ix., pp. xxv.–xxvi.), arranged the subjects in the following order:—

1. Blast furnaces.
2. Rolling mills and forges.
3. Miscellaneous metal trades; among the most prominent of which latter are foundries.

98. In this Report Mr. Longe adds a brief account of the foundries in the West Riding of Yorkshire. Also an account of the machine shops in the same district; a subject dealt with more largely by Mr. Lord in his Report on the miscellaneous manufactures of Lancashire (Third Report, p. xxvi.)

99. In these foundries the following manufactures are carried on:—

(1.) Steam engines, locomotive and stationary, railway carriage wheels, &c.

(2.) Self-acting machinery employed in the metal manufactures.

(3.) Machinery used in the worsted, woollen, flax, and other spinning and weaving trades.

Age of boys employed.

100. In the two first of these branches of employment boys are seldom taken to work before the age of 13, but in the latter a great number of boys between 10 and 14 are employed, and the general age at which they begin work is between 11 and 12 (B. 4, 5.)

Work not unhealthy.

Overwork common and often excessive.

101. The employments themselves are simple, both for boys and youths (B. 6–8), but the "prevalent evil" is the system of overwork which is common in every manufactory" (B. 9); and the amount of this overwork for the young is often excessive. It is only in a few manufactories that the hours said to be the "regular hours," and which nearly correspond with the factory hours, represent the actual hours of work.

"One boy of 16 years of age worked from 6 a.m. to 10 p.m. for about five months together (b. 5). Another boy of 16 years of age had worked at filing, generally from 6 to 7, sometimes three days running to 11 p.m. (b. 8.) In one of the largest works all the boys had been working to 8 for the last five weeks previous to my visit (b. 12–14. *See also* b. 16, 18, 28, 31, 32.) It is by no means uncommon for the elder boys to work through one, if not two, nights in the week (b. 17). One case was mentioned to me of a lad having worked from Monday morning to 5.30 p.m. on Tuesday; on Wednesday from 6 a.m. to 5.30 p.m., and then from Thursday morning to 5.30 p.m. on Friday (b. 22).

102. It appears that the habit of working overtime is by no means necessary as regards the young (B. 11.) In the exceptional case of the repair of locomotive machinery, youths above 18 might be substituted by the manufacturers for those below that age in the particular branch of labour in which overtime may be temporarily required. And the tendency of opinion among the principal employers is evidently favourable to the "preventing overtime for children and young persons" * * "as it is now "prevented in the factories" (B. 12.)

Youths under 18 should be placed under factory hours.

103. The question as to the propriety of placing youths up to the age of 18 under the restriction of the Factory Act in regard to the hours of work is raised by Mr. Kitson, of the firm of Messrs. Kitson and Co., Locomotive Works, Hunslet, who states (b. 6), that he "took a leading part in favour of the Factories Acts 30 years ago." In his own works it appears that he is "strongly opposed to overtime," but that "the trade requires "that he should have recourse to it occasionally." He then states his objection to that clause of the Factory Act which prevents youths up to the age of 18 from working overtime.

"There is no work at which younger children could be properly employed. The only question, therefore, affecting my trade would be the limitation of the hours of work for young persons under

IRON SHIP-BUILDING.

LETTER FOUNDRIES IN LONDON.

COPPER WORKS OF SOUTH WALES.

18 years of age. I am of opinion that such a limitation, although it would undoubtedly be very advantageous for the youths, would have the effect of interfering with the freedom of the adult workmen, with whom they work as assistants, and it might cripple us materially in getting our work done. I am strongly opposed to systematic overtime, but I do decidedly consider that trade requires that we should be able to have recourse to overtime occasionally. Such a restriction on the working hours of youths between 16 and 18 would also have the effect of keeping them back in their education as artisans. There is much work to which older boys are put which they could not be put to if they could not work after 6 o'clock, so that they could not learn this high-class work until they were 18 years of age. Suppose the age was 16, and not 18, this objection would not apply so strongly."

104. Even if Mr. Kitson's opinion is correct,—that overtime in which youths under 18 are employed is necessary "occasionally,"—it may reasonably be expected that on those occasions persons above 18 may be substituted for those below that age without any serious inconvenience or disadvantage to the employer or to the adult workmen. Mr. Kitson admits that the limitation of the hours of work for young persons under 18, according to factory hours, would "undoubtedly be very advantageous for the youths." What is so cannot fail ultimately to be to the advantage of employers. But Mr. C. W. Wardle, an employer in the same branch, also at Hunslet, states (b. 1), that he thinks "a law preventing the employment after 6 o'clock of all youths under 18 might be "carried out in his works. "I do not think we should suffer. It would be a good thing "for the lads."

105. The other miscellaneous metal trades carried on in Leeds are of the same character as those described by Mr. Longe in the Wolverhampton district (3rd Report, p. 1). The conditions of labour are the same, and justify in the same degree the intervention of the Factory Acts in favour of the young and of females. Much dangerous machinery also requires to be guarded, according to the regulations of those Acts (B. 20).

IRON SHIP-BUILDING YARDS AND ENGINEERS' WORKS.

106. In iron ship-building, each set of "rivetters" has two boys to head the rivets for them. Many of these boys are as young as 9, but they are generally between 10 and 14 years of age. Mr. Longe, who visited several ship-building yards in the Clyde, near Glasgow, at Stockton, and on the Thames near Greenwich, found that rivetters' assistants were employed in great numbers; that they are "often uneducated and badly cared "for" and that although what are called the "regular" hours of work are from 6 a.m. to 6 p.m. "The practice of working overtime for weeks and months together is very "prevalent" (C. 5).

107. This case therefore comes within the same category as that of the iron foundries, and requires the same species of legislation for the protection of the young.

LETTER FOUNDRIES IN LONDON.

The same legislation required as for foundries, &c.

108. About 200 boys are employed in the three large letter or type foundries in London; the majority of them being between the ages of 10 and 13. There are two other large manufactories of the same kind in the kingdom, and a few other small ones in London. The hours appear to be pretty regular, but the Saturday half-holiday is in all cases stated to be compensated for by working two nights in the week till 8 o'clock (d. 1). Another witness states that he sometimes worked to 9 or 10 at night (d. 9). Another states that he does not leave work on Saturday until 6, the usual hours being from 8½ a.m. to 8 p.m. The prevailing hours are from 7 a.m. to 7 p.m., with two hours for meals, and from 8.30 a.m. to 8 p.m., with one hour and a half for meals. The shops in which the boys are employed are described by Mr. Longe as, generally speaking, large and well ventilated (D. 5). The conditions of juvenile labour therefore in this case are not unfavourable. But as the hours are not so beneficial to the young as the factory hours, and as the evidence shows that many of the boys found at work, although they had been at school for various periods, had not been so with sufficient regularity or for a sufficient time to enable them to profit much by such instruction as they had received, it appears desirable to place this branch of manufacture also under the Factory Acts Extension Act.

Should be placed under Factories Acts Extension Act.

THE COPPER WORKS IN SOUTH WALES.

109. The copper works of South Wales consist of—

I. Rolling mills, in which copper is rolled into sheets and rods.

II. Copper smelting works.

Rolling mills similar to those of iron works.

I. The rolling mills are very similar to those in the iron trade. A large portion of the hands employed are youths and boys of 12 years of age and upwards (E. 1–3).

HAND-LOOM CARPET.

HEALD KNITTING.

Day and night shifts. Young boys employed. Hours in warehouses irregular.

110. The work is for the most part carried on in day and night shifts, "as in the iron "trade."* * "In one or two cases" Mr. Longe "found one set only employed, their "hours of work being from 6 a.m. to 9 p.m. One boy out of 12 had worked for four "days together from 6 a.m. to 9 p.m. Another boy of 14 years of age had worked to "12 o'clock every other day previous to Mr. Longe's visit, and was working the same "hours that week (E. 4). The hours in the warehouses connected with those works "were very irregular; one boy of 16 years of age had often worked through the night, "and sometimes two nights in the week" (E. *ibid.*)

Same regulations required as in iron works.

111. These works require that the same principles of regulation should be applied to them which we have suggested in the case of the iron works.

II. It appears that in the smelting department none but adults are employed (E. 1. e. 21).

THE HAND-LOOM CARPET TRADE IN THE NEIGHBOURHOOD OF DEWSBURY, YORKSHIRE.

112. Our report on various occupations in which hand-loom weaving is still carried on to a great extent (2nd Report, p. xliii., also App. E. s. 16) did not include the small manufacture of carpets by the hand-loom at Dewsbury, and a few other branches of manufacture in which the hand-loom is still employed, to which we now proceed to call attention.

Curtailment of meal hours. Bad ventilation. Factory Act applicable.

113. Mr. Longe states (F. 1) that there are now about 2,300 weavers in the trade, and that although children are employed at a very early age (from 8 to 13), the hours of work for them are not excessive (F. 4). They are employed at the very simple operation of "winding." The irregularity of the curtailment of the meal hours, and the bad state of ventilation and want of cleanliness of the workshops are the principal evils of the trade, affecting the young, which would be remedied by the application to this branch of employment of the Factory Acts Extension Act.

Blanket and coarse linen weaving in Barnsley and neighbourhood.

114. Mr. Longe states that the employment of weaving blankets and also some coarse kinds of linen by the hand-loom is being superseded so effectually by the power-loom, that evidences as to the condition of the few children employed would be superfluous.

HEALD KNITTING.

Circumstances similar to the fustian cutters.

115. "A heald is an open knitted frame work, made of cotton, and fitted to looms to "raise the threads of the work in the process of weaving" (G. 1.) They are still often made by hand, "and under circumstances not unlike those of the fustian cutters" (G. 2). The localities of the manufacture are chiefly the villages of Mottram, near Ashton-under-Lyne, Stockport, Oldham, and Manchester.

116. Children begin to aid in the work at the early ages of 5, 6, and 7 (G. 4). In some places as many as 20 are collected together; in one place 90; "but the usual "number is seven or eight" (G. 6). Many of these little children "have worked 14 "hours a day as a regular thing."

117. "I used often to go to sleep at the work," said one of 13, who had worked from 6 years of age for 14 hours a day, so long as there was work to do; then the knitter "would hit me to wake me up" (g. 4). Another, who had, however, not begun until 10 years old, "had often and often to work from 6 a.m. to 8 and 9 p.m.," though the usual time was from 6 a.m. to 6 p.m. (g. 1). This took place in country districts, but even in Ashton and Stockport, where some are said to begin work at 6 or 7 years old, the ordinary hours are from 6 a.m. to 6.30 or 7 p.m.; and from the statement of Mr. Morris (g. 7) regarding the great pressure at certain times, it is quite clear that Mr. Coles is correct in asserting that in towns also, "in busy seasons, when they are pressed "to finish by a fixed time, great enormities are practised in the way of long hours" (g. 9), (G. 13).

The same legislation required.

118. In regard to deficiency and irregularity of meal times, and to the physical injury to these young children arising from beginning work so early, and from the position in which they work (G. 14, 15), there can be no doubt that the medical and other opinions quoted by Mr. Lord lead correctly to the conclusion that this is a case for the interposition of Parliament, to as great a degree as that of the fustian cutters, who are now protected by the Factory Acts Extension Act. Mr. R. W. Coles, sub-inspector of factories, gives it as his opinion that they require regulation *more* than the fustian cutters did (g. 9).

THE TOBACCO MANUFACTURE.

The Tobacco Manufacture.

119. The tobacco manufacture is carried on in many large towns in the United Kingdom.

Numbers.

120. The numbers employed in England and Wales, according to the census of 1861, in the manufacture of tobacco, with which that of cigars and snuffs is often combined, were,—

Males of all ages	3,968
Females	872
Total	4,840

Of these there may be estimated to be, according to the census, about 800 males and 200 females, total, 1,000, under the age of 18.

121. In Scotland there are, according to the estimate given by Mr. Longe (H. p. 80 § 1) and Mr. White (H., p. 85 § 14).

In Glasgow, boys under 18, about	700
Leith	200
The rest of Scotland	300
Total	1,200

122. The numbers in Ireland are, according to the census, about 1,000, of whom all but 84 are males.

123. Our evidence was collected in Glasgow, Edinburgh, Leith, Newcastle-on-Tyne, Leeds, Sheffield, Liverpool, Manchester, and London.

124. The processes and the conditions under which the manufacture is carried on being uniform, we believe that the evidence we have obtained sufficiently represents the state of the trade in other parts of the kingdom.

125. In the tobacco manufactures visited by our assistant commissioners, in which cigars and snuff were also made, there were found at work in England about 500 and in Scotland about 900, out of the estimated total of males under 18. In the places visited in England, about 300 females were also found at work, many being under 18.

Nature of process.

126. The processes in which children are employed are,—1, spinning, *i.e.* making roll tobacco; 2, packing cut tobacco; 3, making "bunches", *i.e.*, preparing the tobacco leaves for the cigar makers.

127. In Glasgow the 700 boys said to be generally employed there, are engaged in the process of "spinning." They are taken from the poorest and most neglected class (H. 80 § 2, p. 84 § 2, p. 89 § 11). Girls are employed in the spinning shops of London, Leeds, Liverpool, and Manchester.

Age.

128. The children are employed very young, from 8 to 13 in Glasgow (H. p. 80 § 1) and Edinburgh (H. p. 84 § 12), the majority beginning work before 9 years of age at Liverpool and Manchester (H. p. 86 § 1). Those found at work in London were usually between 11 and 14 (H. p. 82 § 13, p. 83 § 33).

Overtime.

129. In Scotland overtime is not common in this employment. In Glasgow it occurs occasionally up to 8 o'clock, "but only for two or three weeks in the year" (H. p. 80 § 3); but in some manufactures in Liverpool are not unfrequently exceeded by the space of two hours (H. p. 89 § 8); and Mr. Lord was told by one girl that "she had worked until 9 "for every night for three weeks, and the foreman stated that they usually worked on till 9 p.m. from August to December" (*ibid.*). At these works no tea time was allowed, and several of the girls told Mr. Lord that they were "very tired when 9 o'clock came." Also in some shops in London "boys had been kept to 10 p.m. for a whole week (H. 3).

Meal-times.

130. In Newcastle-on-Tyne there is occasional overtime "up to 11 p.m." (H. p. 87, §§ 25, 26). The meal times also are apt in every case to be curtailed and irregular. (H. p. 89 § 9).

State of places of work.

131. Much attention is given by most of the large manufacturers in this employment to the state of their workshops, but it appears to be often otherwise, in the case chiefly but not invariably of the smaller places of work. Mr. Lord states that many of the small places of work visited by him were "dirty and unwholesome," and that even in shops where a hundred hands and more are frequently employed, there is in this respect need of much greater attention than has hitherto been bestowed on matters of ventilation and lighting, the gas jets being in many cases placed immediately in front of every two or three persons on a level with their heads, or raised but little above them."

132. Mr. Lord also refers to some very interesting evidence he obtained relating to "the "extreme importance of good ventilation in the work place, or at all events in those "where young women are employed in this business (H. p. 89 § 10).

UMBRELLA AND PARASOL HANDLES.

Moral condition.

133. The moral condition of the children employed in tobacco manufactures was described in the reports and evidence of the Children's Employment Commission of 1841 as very low. It would appear that although in some respects there is still evidence of a low moral sense (H. p. 90 § 12), on the whole there has been, especially in Glasgow and Edinburgh, and in Lancashire, a considerable improvement (H. p, 80 § 2, p. 84, § 12, p. 89, § 11).

Education.

134. In Edinburgh in 1852, the "tobacco boys' school," supported almost entirely by the importers, makers, and manufacturers of tobacco, was remodelled and improved, and a few years afterwards a similar school was established in Glasgow. Mr. White gives some interesting particulars of these schools (H. p. 84, §§ 8–15, and p. 86, § 19). Mr. Longe observes that the results, though in some respects beneficial, have not corresponded with the desires of the promoters.

135. The tobacco boys' school is open from a quarter-past 7 to 9 o'clock every evening. It does not appear, however, that the average attendance has ever represented so much as one half of the boys employed, notwithstanding the exertions of the employers, and the prizes and other inducements offered.

136. The same necessity for some further effort in the direction of education is shown by Mr. Lord in his remarks upon the children in this employment in Liverpool and Manchester (H. p. 90, §§ 13, 14). It is satisfactory therefore to be able to refer to the opinion of the employers in this manufacture in Scotland "in favour of an attendance "enforced by law," as under the provisions of the Factory Act. Mr. White states (H. p. 84, § 6):—"From what I thus learned, it appears that the employers, notwithstanding their efforts, find it difficult to secure such a school attendance as they "desire, and that an attendance enforced by law would be rather welcomed than objected "to by the leading manufacturers. It appears also that the trade is of a nature which "admits of being carried on within moderate and uniform hours, as it generally is; "though on the other hand these hours are long for boys so young as most of the tobacco "boys are, and it is shown that during brisk trade it has frequently been found that these (*i.e.* late) hours unavoidably encroached upon those of the school" (H. p. 84, § 21).

Tobacco manufacture should be placed under the Factory Acts extension Act.

137. The inference from the above description of the conditions under which this manufacture is carried on is, that it is desirable to place it under the Factory Acts Extension Act, and that no inconvenience to those carrying on the manufacture would be likely to ensue.

The tobacco manufacture in Ireland should be included.

138. The conditions of the trade having been shown to be uniform, it appears that the manufactories in Ireland which exist in some of the principal towns—Dublin, Belfast, Cork, Limerick, Dundalk, and others (p. 86, §§ 16, 18) should be included in any measure thought desirable for England and Scotland.

THE MANUFACTURE OF UMBRELLA AND PARASOL HANDLES IN THE NEIGHBOURHOOD OF STROUD.

139. The manufacture of these articles in great quantities is confined to this locality. There are five or six employers engaged in the trade, the largest employing between 250 and 300 hands, "about half of whom would be under 18 years of age." Very young children, both girls and boys, are employed, many of them between 7 and 9 years of age (I. 2).

Very young children employed in cutting bone, and for long hours.

140. Very young boys are engaged in cutting bone with circular saws, and in drilling bone. "The rooms in which this work is carried on are described by Mr. Longe as low "and badly ventilated. The atmosphere was loaded with bone dust," (I. 4).

141. The little boys employed at the circular saws are constantly cutting their fingers. One little boy, between 12 and 13 years of age, had been working at the circular saw, from 7 a.m. to 8 p.m. (meal times excluded), for one or two weeks together (i. 5, i. 2, 17).

Women and children employed in varnishing, &c.

Overtime very common.

142. Women and younger children are employed in polishing, varnishing, and drying the sticks. "White and red lead is used to give a smooth surface and body to the "varnish. The children have suffered from its unwholesome properties, and it seems "that employers are endeavouring to dispense with it as much as possible" (I. 5). "The rooms in which the varnishing is carried on are, in the case of the largest manufactory, very low and badly ventilated" (*ibid.*) Overtime is very common. "One "boy under 11 had often worked three nights a week to 8." A girl of the same age had sometimes worked a whole week to 8 (I. 6).

143. The above facts show that this is a case which requires to be placed under the Factories Acts Extension Act.

THE MANUFACTURE OF BOBBINS AND SPINDLES.

MANUFACTURE OF BOBBINS AND SPINDLES.

144. The manufacture of bobbins and spindles is carried on in all parts of the United Kingdom where there are spinning and weaving manufactures. The chief processes are sawing, turning, boring, and smoothing, by means of circular saws, lathes, drills, &c., worked by power (K. 1). Some miscellaneous articles, such as cotton reels, are also sometimes made in the same factory (K. 2).

145. The numbers employed of all ages, in both branches, according to the census of 1861, are upwards of 2,500, of whom upwards of 700 are estimated to be under 18, all males (K. 8).

146. The evils to which attention is called in the evidence are, 1. The early age at which children begin this work. 2. Overtime. 3. The injury to health caused by the dust given off in the various processes, and by the neglect of proper ventilation. These points are thus illustrated in the evidence.

147. George Owen, a bobbin turner, of considerable experience in all parts of the kingdom where the manufacture is carried on, thus states his opinion as to the ill effects of beginning work so young.

Early age at which boys begin work.

> "Putting boys so young to the work, viz., commonly about 9 or 10, is almost the worst thing in the trade. They work that hard that they get fairly mashed up while young, and it crushes their growth, and they can never get to know a thing as they ought, to read or that. They do not usually go to night schools, in the country at least. It would be a very good thing to get this Factory Act, and it is generally thought so in the trade. Ever since you have been in here I have been asked to speak about the boys. It is a thing very much thought about in the trade. If a man has several sons, he is almost forced by his master, in many cases, to bring them to the work, even before he would wish it, or though he would like to keep them at school longer, unless he will bring them the master will very likely refuse to have the man. The men may, perhaps, think that the Act will be good for them, but it will do more good to the boys than to the men, the men generally working by the piece, so that it would not make much difference to them." (k. 3.)

148. At Staveley a young man of 17 states that he began work at 8 years of age (k. 4). The manager of the works stated that of 31 boys, the two youngest were 8 years old (k. 7).

149. At Bradford a boy of 8 was found at work (k. 6).

150. At the same place a boy engaged at shuttle making began at 8 years of age (k. 21).

151. The incumbent of Windermere (k. 13), and also the incumbent of Staveley (k. 14), bear testimony to the evil consequences, physically and morally, arising from the early age at which the children begin to work at this trade.

Long hours of work.

152. The length of the hours of work is thus commented on by the witness abov quoted (k. 2).

> "Where the work is done in regular factories the hands work the factory hours, and in factory towns generally the bobbin mills work the factory hours, or but very little longer. But in some places, especially where water power is used, which is chiefly in small country places, the hours are longer, as in this Westmoreland district from 6 a.m. till 7 p.m. One of the Staveley bobbin mills, however, works the factory hours because the owners, I believe, have a thread factory away in Lancashire. In a country place in Derbyshire where I was about four years ago, the hours were from 6 a.m. till 8 p.m., and on Saturdays till 6 p.m. The hours were the same, viz., from 6 a.m. till 8 p.m. in Scotland, when I was there a few years ago, except in Glasgow and Paisley, where the factory hours are kept. Even in Dundee, though it is a factory town, they had the same long day. Long hours are nothing particular there, as the hand-loom weavers work so long and late, all night, I believe, at times. In Scotland in a busy time I have known the hours to be from 5 a.m. to 8 p.m. I have understood that at Inverness they work as long. I do not remember any place where if the men wrought long hours the boys did not do the same. The boys are forced to do so as they are getting work ready for the men, and we take it from them" (k. 2).

153. At Messrs. Chadwick's manufactory, Staveley, the dinner hour is curtailed to make up for the Saturday half-holiday. At the manufactory of Mr. Philipson,

> "The proper day's work is 13 hours, with two hours allowed for meals; but the men choose to take less, viz., 20 minutes for breakfast, the same for tea, and half an hour for dinner, so as to leave 50 minutes sooner" (k. 9).

154. At that of Messrs. Stuart, Mr. Rowland Stuart states (k. 11),—

> "We begin work at 6 a.m. and work till 7 p.m. on Monday, Tuesday, and Friday; till 7½ p.m. on Wednesday and Thursday, and till 4 p.m. on Saturday. There are two hours daily for three meals."

155. At Messrs. Briggs' manufactory, Bradford, the meal hours are curtailed. Mr. J. Brigg states,—

> "Our day is of the same length as the factory day, but the hands leave at 5.30 p.m. instead of 6, taking only 20 minutes for breakfast and 40 minutes for dinner. The usual hours in the trade in some parts are, I believe, 13, but in manufacturing towns like this the hands get privileges which they perhaps do not in the country. We sometimes make overtime till 8 p.m. The hands are allowed to get tea then, but there is no regular stoppage; the engine does not stop" (k. 15).

156. At Messrs. Clayton's, shuttle and bobbin manufacturers, Bradford, a boy of 10 years of age (S. Torr, k. 21) states,—

"All the week we have worked over till 8 p.m." (from 6 a.m.) "Have a quarter of an hour for tea then."

157. The long hours of work for children are adverted to by Dr. Dobson, M.D., Windermere, and by the incumbents of Windermere and of Staveley quoted above (k. 12, 13, 14), as tending to aggravate the injurious tendencies of the work arising from the dust created during the processes, and from the stooping posture while at work.

Bad effects of dust.

158. The ill effects of the dust are thus described:—

"If you were to go over to yon side where they are doing big bobbins, you would see the dust lying very thick on the top of men's coats. If there were openings above they would carry the dust up more. In all the places where I have been I never saw or heard of any contrivances anywhere for carrying off the dust, such as the grinder's fan, which I have seen in Sheffield, or any other contrivance which I have seen for the purpose. Men in the trade in general are of opinion that the work is not healthy. Very many spit, and many go off in consumption. About the time that I came here last year two men died of it at Staveley, one a young man of 26, and another an older man of about 50. Another from Staveley is lying bad of consumption now. I am in bad health myself. A short time ago I had to go to the doctor (Dr. Dobson, *see* No. 12), and he said he thought it was this consumption coming on. He asked me how were the places that I had been in for ventilation, and it said that ours here was very bad. It looks a deal cleaner now, as we have just had the ceiling and walls swept. He spoke of one or two work-places near here as very good, but said that others were pinched up, and that the unhealthiness was a good deal from there being no ventilators to carry the dust away. I had to give up work. I took to spitting blood, and for about a week brought it up twice a day as much as a pint at a time, perhaps before I could get it stopped. I have lately come back to work, but can't do much. I can't stand to it, but have to sit; my back feels as if it would drop and let me down on my knees. I have pain there, and I had it in my chest. As a boy I never had much to complain of in health. I was at the strongest and heaviest I ever was when about 17. After about 20 I never carried much flesh, and I began to get bad in my breathing, and have been so ever since. I am now 29, and began the trade at 12 years old or soon after" (k. 3), (p. 2).

159. Another witness, Mr. Philipson, of Messrs. Chadwick's works, Staveley, thus describes the effect of the dust upon himself (k. 4):—

"Don't like the work it is so dusty, and stuffs you up so; but it's different according to the kind of wood and the job; alder and ash are very bad if dry. The dust chokes up your stomach, and you are obliged to spit it up or you couldn't get on. It stops your breathing; all would tell you the same. Sometimes feel a tickling in my throat. Sometimes your hair is as white as can be with the dust. (Q. Is it healthy work?) Nay; I never heard any say it was healthy; I have heard them say that it wasn't. Have lost a great deal of time sometimes because I was not well. Have the rheumatism and pains in the small of my back; the doctor didn't say what it was from. Sometimes when the work has been very dusty I feel a pain in my breast. Have been bothered with a deal of headache; a good deal of 'em has it and some never has. The work used to have a very great effect of my head; stimulated it like as if you couldn't stand, and made me feel quite dizzy. (Q. Is there much noise). Why you'll have to shout if you want to get anybody to hear you speak."

160. Dr. Dobson thus sums up the causes of the alarmingly high mortality which he believes to exist among the bobbin turners of the Windermere district (k. 12):—

"Young and tender age of entering the mill, long hours, exclusion from sunlight and fresh air, dusty nature of work, mode of living, want of out-door exercise, and in some instances to the badly ventilated and lighted mills."

161. It is plain that the provisions of the Factory Acts Extension Act would be beneficial in this case, especially the clause (4) requiring that—

"Every factory to which the Act applies shall be kept in a cleanly state, and be ventilated in such a manner as to render harmless, so far as is practicable, any gases, dust, or other impurities generated in the process of manufacture that may be injurious to health."

INDIA-RUBBER WORKS.

162. The numbers given in the census of 1861, as employed in this branch of manufacture, were only 1,290 of all ages, of whom under 300 were by computation less than 18 years of age. But Mr. Lord found in the course of his inquiries in 1864–5, above that number in the five works which he visited, and he justly remarks that this manufacture is probably "still far short of its full development" (L. 1, 2). The condition, therefore, of the children, young persons, and women employed in india-rubber and waterproofing works is a "more important subject of inquiry" than would appear from their present numbers.

Excessive hours of work.

163. The only circumstance connected with their employment which points to the necessity for legislative interference in their behalf, is that of excessive hours of work for children and young persons of both sexes, and women. About three-eighths of the whole number employed are usually females (L. 4). On the subject of the long hours of work Mr. Lord states (L. 8–10),—

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The hours of work are often long, from 6 a.m. to 8 and 9 p.m. being not unusual in Manchester and in London also. Mr. Birley's evidence on this point relating to the need to strengthen the employer's hands by legislative interference is very valuable (No. 1). Some time after he had given it, on meeting me again, he mentioned in the illustration of the difficulty he found in keeping to regular hours, that although work had been going on for some time before Whit week from 6 a.m. till 10 p.m. at his works, he should not have discovered it but for the accident of one of the young women fainting at a tea party given by him to the workpeople. This led to inquiry, and then he found that her exhaustion was attributable principally to having been working so long for several nights previously.

"Among those whom I questioned myself at Manchester, I found a boy of 14 who had worked on most nights, except Saturdays, from August to Christmas, from 6 a.m. to 9 p.m., and a girl of the same age, who said that she was very tired after having worked till 9 p.m. from 6 a.m. for three weeks (Nos. 2–4). Girls of that age in London have worked from 6 a.m. to 8.30 p.m., often for a fortnight together, and sometimes to 9.30 p.m. (No. 12, and see Nos. 10, 13, 17, as to adults)."

"In one department of Mr. Hamer's works a system of night and day turns was in use. This is not general in the trade, and would be discontinued there (No. 8). It has been adopted elsewhere in seasons of great pressure (No. 1)."

Employers desirous of support of Factory Acts Extension Act.

164. Several of the employers whose evidence was given to or obtained for Mr. Lord agree in wishing for the support of factory legislation in limiting the hours of work for females and for the young; and the desire manifested by them to improve the condition of their workpeople, and to extend to them the benefits which they have seen to result from the Factory Acts in other branches of employment, are circumstances which cannot be recorded without feelings of gratification.

Overtime unprofitable.

165. Another instance may here be added to the many already given in our reports, of an employer having discovered by experience that overtime was not profitable. Mr. Spill states,—

"We have not made any overtime for the last two years; before that time we often made two or three hours' overtime, but we found that no more work was done than could be done in the regular hours, so we have now adopted a plan of paying for the day of 10 hours whether they work the whole day or not; in the summer time they frequently make only a three-quarter day, that is from 8 a.m. to 5.30 p.m. We have the same rule for our piece-workers, and as a matter of fact, as much is done in 10 hours under proper management as used to take 13 or 14, for they used to loiter over their work in order to get paid for overtime; the employer saves a great deal in gas alone," (l. 17.)

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166. This branch of industry is one eminently requiring legislative regulation.

167. It consists of two departments: the manufacture of coloured flowers, which is almost entirely confined to London; and the manufacture of mourning flowers, which is carried on both in London and in Manchester.

168. The persons employed are almost entirely females. Sex.

169. They are thus distributed according to the census of 1861:— Numbers.

In London:			
Under 15 - -	463		
Between 15 and 20 -	2,335		
		2,798	
In other parts of England and Wales:			
Under 15 - -	550		
Between 15 and 20 -	2,503		
		3,053	
			5,851
In all England and Wales:			
Above 20 - - - -			4,946
			10,797

170. In these totals there are of males only 620 over 20, and a few youths and boys under 20; none of the latter being under 13.

Hours of work.

171. In the manufacture of coloured flowers, in which the great majority of all the persons in the trade are engaged, there are two busy seasons of four months each. During these periods, amounting to two-thirds of the year, the hours of work are described as "tremendous."

"For a considerable portion of that time girls of 16 and upwards constantly work 14 and 15 hours a day, and occasionally as much as 18. One girl, aged 19, had worked twice all night through, and on till 5 p.m. on the first, and 10 p.m. on the second occasion. Even children of 12 and 10 have often worked 14 and sometimes 16 hour" (M. 11).

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172. It is satisfactory to learn that these long hours—most prejudicial as they are to health—are "wholly unnecessary." They arise from the "inveterate habits" of the workpeople themselves who in this, as in many other trades, in which the hours of labour of the young are not regulated by law, persist in idling during the early part of the week, and making up for the time lost by late and exhausting labour towards the end. This habit is thus described:—

"Ours is the worst trade for irregularity; we cannot get the workpeople to come at 9 a.m. or anything like it. Many won't come till 11; they play on Monday and don't do much on Tuesday; on Thursdays and Fridays they work hard. We have double as much work done on those two days as on the rest. On Saturday they leave between 2 and 4 and do very little in the morning" (m. 1). "They generally waste a great deal of their time, and get through as much in the last three hours of the day as in all the rest." Even when the demand is greatest, "they won't come early; and if they work on till 11 or 12 at night, they cannot be early next morning" (m. 5).

173. It is clear from the evidence that both employers and workpeople desire that the hours should be "less and more regular than they are, but they cannot form a " system for themselves, and no employer can enforce rules upon them because the " habits of the people are all the other way" (m. 2). We, the employers," said one witness, " suffer more than any, for as long as any work is going on, we" must be about" (m. 1). Some have made efforts to limit the hours and reduce them to regularity, and have to a certain extent succeeded (m. 11); but others have been obliged to abandon the attempt after a trial (m. 1). It is acknowledged that the workpeople suffer in health from the present practice, not only by the lengthened hours, but especially by the consequent necessity of doing so much more of their work by gaslight and by the heat and bad air (m. 2). It is noticed that those workpeople who are early and regular are "certainly more healthy" than the others (m. 1); and in another establishment, where the hours are regular, it was asserted by one of the workers that they were all in better health than those under another employer where the usual long and irregular hours prevailed (m. 13, m. 44).

No special difficulties in the way of legislation.

174. The only question appears to be whether any special difficulty exists which would render it inexpedient to place this manufacture under the regulations of the Factory Acts Extension Act. We are of opinion that there is none.

175. Two of the leading employers in the trade thus express themselves on this part of the subject. Mr. Lockyer states (m. 1),—

"I should like very much to have the whole trade governed by some sort of Factory Act; we could manage very well with working from 8 till 8 or from 9 till 9, and I am sure that the workpeople would like it too. Employers like myself would be pleased to support any such scheme if it were general in the trade."

Mr. Vernon states (m. 5),—

"For my own part I should be very glad to have a regular system of hours enforced, and would give any scheme to secure it all the assistance in my power."

Objections suggested not valid.

176. Two subjects suggested themselves in the course of the inquiry as possibly involving objections to legislation: one proceeding from the point of view of the workpeople, the other from that of the masters.

177. The first was to the effect that as this is a "season trade," and the slack times amount to almost one-third of the year, it would be hard to prevent the people "earning " as much as they could in the busy season to make up for the absence of work in the " slack time" (m. 10). The competition of French goods of the same kind was also urged in reference to this point by the same witness (*see also* m. 12).

178. But the testimony is very strong to the fact that there is nothing really gained either by the employers or the employed by these extra hours, and that if the workwomen would come early and punctually, and work industriously during the 12 hours from 8 a.m. to 8 p.m., or from 9 a.m. to 9 p.m., nearly if not quite as much work could be done as is now got through on these premises in the three or four hours more (M. 12).

179. The forewoman of Messrs. Lockyer, Miss Emma, stated (m. 2), "What they " want is to be all of them compelled to come or to leave at fixed hours whenever they " are working. They would earn as much between 9 and 9 as they do now by staying " till 11 or 12, for the more they have of gaslight the less they are able to do. It is that " and not the mere length of hours that injures health, the heat and the bad air." Mr. Vernon states (m. 5),—" I am quite sure we can get through all the work we want in 12 " hours, 8 to 8 might suit some, and 9 to 9 others; but a fixed time of that kind would " suit the hands admirably." Miss Wood states (m. 6),—" I quite agree with what Mr. " Vernon says about it being an excellent thing to limit the hours, and am sure that all " the work we want could be done between 8 and 8." Mr. R. Johnson states (m. 11),— " It is not those who work the latest that earn the most, but those who are steady " and don't waste their time in talking and laughing. * * I have at least 20 whose

" weekly earnings, taking the whole year through, busy times with slack, will average " 15*s*."

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Small masters must be included.

180. The second point is that the large employers apprehend a difficulty in bringing the small ones also under regulation, and they rightly consider that injustice would be done, and a most ineffectual remedy applied, unless any Act that might be passed would reach the smaller class of employers.

181. It appears that the trade is carried on by the two classes of employers under very different conditions.

Larger places of work, and their state.

182. It has become the practice within the last 12 years to collect large numbers in this trade to work together. "It used to be very rare for 50 to work in one place (d. 11), " but now, out of nine large establishments," visited by Mr. Lord, " five employ, " when busy, more than 100 persons on the premises; at one there are seats for 180" (M. 6).

183. Where numbers such as these are collected together they are easily reached by legislation. The place of work falls within the accepted meaning of the term "factory," and the ordinary administration of the factory laws could be readily applied to it. And that such supervision and regulation is required in this case is abundantly plain from the evidence.

184. Mr. Lord thus sums up the nature of the accommodation and the sanitary state of these places of work. (M. 18.)

"The accommodation in large factories is in many cases quite inadequate to the numbers employed there in the season. In one room which I measured, the number of cubic feet per head was 131; in a second, 111; the latter room was calculated to hold more than 70 persons, the former about 14. In a third large room, when at its fullest, for six weeks or so, the cubic feet per head are 95; in another, 86; and in a fifth only 70. The heat and bad air are very generally complained of; the gas burners often have neither glass nor shade. Small gas stoves, used to heat the tools, are commonly placed on the tables, almost under the mouths of the workpeople. In some cases the smell from the waterclosets makes the whole workroom offensive (No. 15). The business, strange as it may seem, is essentially dirty and 'dusty beyond belief' (Nos. 6, 11). One witness finds it necessary to have one of his workrooms limewhited twice, and another papered once, in every year" (No. 11).

Small places of work, and their state.

185. But,—

"Much work is still given out to be done in small places where a family works with two or three others to help them. This is particularly the case with mourning flowers, violets, and other simple and common goods. In most cases the work places are mere dwelling rooms, sometimes back kitchens on the basement. These are often dark and fetid" (M. 17).

186. Of these small places of work the following is the account given by several witnesses:—

"The state of things is no doubt worse in small places. There are many small men with whom we (the larger employers) in fact compete, who occupy, it may be, a six-roomed house, and employ six or seven little girls in day or taskwork, in a room upstairs, or a back kitchen, and have their wives to finish off" (m. 1).

187. The above witness, Mr. Lockyer, states that out of 250 workpeople to whom he gives employment in the busy season, about 100 would be working at their own homes in the manner described, working in small rooms with their parents, together with a few paid workers.

188. Of the children in these small places the forewoman of Mr. Lockyer states (m. 2), that " in the smaller places there are more children in proportion to the total " number, and they are younger than ours." And Miss Wood, forewoman of Mr. Vernon, states (m. 6) that, " these small men who have their wives or perhaps another " young woman and two or three little girls to help, working altogether in the living " room, if not the sleeping room, they must be limited too, or else all of our work " would go to them."

189. The precise proportion of children and young persons employed at home to the entire number in the trade we have not the means of stating, but it is evidently very large. The largest employers, as has been seen, give out much of their work, and several of the witnesses assume as a matter of fact that the number is large. Mr. Clitheroe states (m. 18) that "he has seats on the premises for 180, but besides these many out-" door hands had work given out to them, especially for violets." And Mr. Damon states (m. 33) that he " employs 17 females in making flowers of various kinds, not " wholly mourning, though that is perhaps his chief business;" and that very few, if any, manufacturers of mourning flowers in London employ more than he does on his own premises. " Most is done by men at home with their wives or some children to help. " In Manchester, and I believe in Nottingham too, many more young ones are col-" lected to work in one building than is the case here; indeed, they are able by that " means to obtain their labour cheaper than we can, and so are supplanting us in the " market for the common goods."

ARTIFICIAL FLOWER-MAKING.

190. The trade appears to be increasing in Manchester, about 300 persons being now engaged in it there (m. 35), "chiefly girls from 10 to 16 years old" (m. 42). Five or six employers are stated by the last witness to employ from 12 to 20 hands; "a "number more will have six or seven working for them."

Same legislation applicable as suggested in 2nd Report.

191. The case of the small employers in this trade is in all respects similar to that of the small employers in the metal trades treated of in our Third Report; as also that of the "Private houses," and the "Cottages or small rooms in private houses, and other "places of work of a like nature," described in our Second Report; and we are of opinion that the same kind of legislation which we have submitted in s. 465 of our Second Report as applicable to those cases may with entire propriety be adopted in this case.

Ill effects of the employment on physical education.

192. The ill effects of the employment on the physical condition of the workpeople, especially of the young, afford another reason for legislation. The strain on the attention of the young in the course of the long hours of work is great; and as a great deal of the prolonged labour takes place by gaslight, and in a high temperature, the injury to the eyes and the general health is proportionately increased. Mr. George Elphick states (m. 10),—

> "A bad instance of the way in which such children who help older ones are overworked occurred in our own establishment some little time back; directly I found it out I put a stop to it, but it was only by noticing the state of the child's eyes that we were led to inquire further. She was about 13, and came to help an older sister, who used frequently to make her stay and work till 11 and 12 at night. We were told once when we found her there late that she was only waiting for her sister to go home with her, but that was untrue.
>
> "It is very trying to the eyes to have to distinguish by gaslight, or perhaps as daylight is failing, between different colours such as blue and green, or different shades of colour very nearly alike; and that a child would have to do in many cases. The mere putting the wire through the very fine holes in the centre of the little pieces of material, and the effort to observe which of two very nearly the same size should come next in order, is, for a child, and at such a time after a day's work, hurtful."

193. "The effect of the constant sitting in 'hurting the chest' is mentioned by some of the witnesses (m. 20, 22, 23), and the dust which arises from the colouring matter in the flowers 'is complained of more than anything else in the business as being injurious both to the 'eyes and to the health generally' (M. 24). One witness states (d. 6), that the dust which is produced 'is beyond belief.' * * 'It gets on the hair and the pleats of the 'dress, and lies quite thick upon the table after the day's work.' Mr. R. Johnson states (m. 11), 'It is a very dirty trade, though you would scarcely think so. It takes three 'persons every Saturday from 5 and 6 till nearly 12 p.m. to wash and clean the four 'rooms thoroughly. I have them lime-whitened twice a year, and where the walls are 'papered have a fresh paper every year.'"

194. The evidence of Mr. Taylor, F.R.C.S., of the Central London Ophthalmic Hospital (m. 31), is confirmatory of the above statements. It appears that "artificial flower "makers are frequently patients of that hospital, and that they suffer in two ways; "either from 'a form of weak sight known as *asthenopia*,' or from chronic inflammation "of the eyelids."

Irregularity of meal hours.

195. Short and irregular meal hours, which are the common habit of the trade, cannot fail (more especially when in conjunction with the prolonged hours of work) to act injuriously on the health of the young and feeble, "working through the meal times," and "eating at the table where they worked," are referred to as common practices by several witnesses (m. 1, 2, 5, 10, 13, 15, 20).

Effects of the habits of the trade on the education of the young.

196. The age at which the children (almost entirely girls) begin to learn their work is sometimes as early as 8 or 9 years (m. 23). One witness, Mrs. Davis (m. 3), states, "10 as the usual age at which girls begin to learn," and "they have often been "at a smaller place" before coming to work at the large employers.

197. The necessity of acquiring delicacy of touch causes them to begin early (d. 10). The majority, it would appear, begin the work at from 10 to 11 years of age (M. 5). It may be inferred from the figures given at s. 147, that the total number under 13 in the trade, and who would therefore be brought under the half-time and education clauses of the Factory Act, should it be applied to them, would be about 700.

198. The protection of these clauses is greatly needed by the younger children engaged at this work who are still "learners" and "helpers." An end would by their means be put to a system which is common with a certain class of masters not only of employing children during the whole 12 hours without regular meal hours, but of getting an extra amount of work out of them without any extra remuneration. The children are paid by the day, the elder workers, whom they assist, by the piece. The latter are constantly tempted to work over hours in order to increase their earnings. While they remain at work they retain with them the younger children as late as 8, 9,

ARTIFICIAL FLOWER-MAKING.

and 10 o'clock (m. 20, 23, 25), and sometimes later, even to 11 p.m. (m. 11, 20). But the children, working as they do by the day, "get no benefit from the extra "work they do" (m. 10). The system is thus described by Mr. George Elphick (m. 10):—

> "But if this inquiry is intended to aid the worker and prevent the oppression caused by the heavy "day" or "task" work, its results must be most beneficial. There is a great deal of that in the trade, and it is among employers with whom such a system prevails, that you will also find the younger children in the trade. These persons agree in the first instance to give their hands a fixed weekly wage, calculated on the basis of their doing so much a day; after a little time they put the screw on, and work them up from four bunches a day, say, to four and a half, then to five, and even six by degrees, so that at last they get a day and a half out of them for a day's wage. It is especially on the children that this falls heavily, for they are of course much more frequently paid by time than by piece work. The same thing operates where the older hands are allowed to bring children to help them. Their object, of course, is to earn all they can, but the children are paid by them so much a day or a week, and get no benefit from the extra amount of work they do, while they are continually being urged on to "be quick" and to "look alive," and if not knocked about, are at least frightened or worried into over-exertion."

199. That the education clauses of the Factory Act are greatly needed to remedy past neglect in the education of the young is clearly shown. Mr. Lord states that he "found girls of 10, 12, and 15 unable to read (M. 29), and many young women appear "to be unable to do so after they have grown up (m. 25, 32). Out of 40 females in "the employ of one master, none of them under 13, and only three under 15," most of them being "about 16 to 20 years old;" it was stated by the employer (m. 32) that 9 out of 12 were badly educated; they could "perhaps read a little, but not write, and "all of them have a very imperfect idea of right or wrong." The state of education among these young workers at Manchester was found by Mr. Lord to be even worse than in London (M. 31, m. 35, 36, 37, 38, 39, 40, 43), and as regards both London and Manchester, Mr. Lord states that,—

> "'The neglected education of the children is attributed rather to the indifference or the vices of 'the parents than to their poverty.' Some of the best educated are those who have had the greatest disadvantages." (M. 32, m. 25, 37, 40).

Benefit of education.

200. That the education of these workpeople would be a benefit not only to themselves, but to their employers, in reference to their trade, is plain from the circumstances of the case. It is a trade in which artistic taste must manifestly greatly contribute to success. The duty having been taken off French goods of the same kind, the English workwoman is exposed to direct and close competition with the French, and as a consequence of the present state of things, "the trade of England has been considerably "affected" (m. 10). Mr. W. H. Boulton states (m. 12), "I am bound to admit "that the French workpeople in this trade excel ours; they take so much more "interest in their work, and have a pride in it; ours use their hands—make up what "you put before them—but do not use their heads." Another employer, Mr. W. Towsey (m. 32), states that he "cannot procure sufficient hands who are respectably "educated, though it is a very pretty trade, and highly paid." He adds that he had "always found that the steadiest and most industrious workwomen were those most "respectably connected and best educated;" and that, "if they were taught by their "parents to believe in and to fear God in their infancy, they would of their own "accord try to improve their education, and would be much better hands at their "trade, which requires some artistic taste."

Sudden orders, complaints of.

201. Mr. Lord states (M. 14), that although comments had from time to time been made to him "upon the utter indifference" shown by wholesale houses to the inconveniences and overwork resulting from the giving of "sudden orders" for goods to be made and delivered within a few hours, in no instance had he heard "such unanimous "and such bitter complaints as from artificial flower manufacturers." Mr. Lord mentions the following facts (*ibid.*):—

> "Those who have used the strongest language have naturally been most averse to letting their names appear in connexion with it; but I am sure that many philanthropic gentlemen at the head of large wholesale city houses would be much shocked and pained if they could realize the feelings entertained by many of these, so to speak, small manufacturers towards those who represent them in such transactions. An illustration of the short notice given by such houses, though not of the complaints above referred to, is given by a witness (No. 5), who mentions an order which he refused, received by him at 5 or 6 p.m. on the day before my visit, to be delivered without fail the next morning; 'it could not be done without working very late.' And similarly another: We had 50 orders one 'after another marked 'special,' or in some such way, coming in at 8 p.m. perhaps, to be delivered 'without fail to morrow morning; or an order at 11.30 a.m. to be delivered in the city at 3 p.m. on 'the same day (No. 10, and see 13).'"

202. The extension of the railway system is said to have contributed greatly to this custom of giving sudden orders, and the consequent hurry, neglect of meal times, and late hours of the workpeople. Mr. Boulton states (m. 12),—

"The extension of the railway system throughout the country has tended very much to encourage giving short notice. Purchasers now come up from Glasgow, Manchester, and Edinburgh once every fortnight or so to the wholesale city warehouses which we supply, and give small orders requiring immediate execution, instead of buying from stock as they used to do. Years ago we were always able to work in the slack times so as to meet the demand of the next season, but now no one can say beforehand what will be in demand then."

203. In our previous Reports we have had occasion to notice this subject of "sudden "orders" and their injurious results; but in those cases the persons who expressed a desire to perpetuate the system were the manufacturers, under an apprehension that if the hours of children, young persons, and women were reduced and limited by law, their trade would be seriously affected, and the facts and arguments we have been able to adduce have been designed to show that such apprehensions were groundless. But happily in this case the manufacturers desire to be able to protect themselves against this cause of overwork; and it appears, indeed, that they would welcome the interposition of the Legislature in putting an end to it. The great preponderance of the evidence given by them is to the effect, as shown by Mr. Lord (M. 12), that the ordinary factory hours would be much more satisfactory to all parties.

Manufacturers desire interposition of Factory Act.

204. We can, therefore, have no hesitation in recommending that the artificial flower manufacture should be placed under the Factory Acts Extension Act.

OSTRICH FEATHER MAKERS.

205. Mr. Lord states that artificial flower manufacturers have been led "in several "cases to add to their own proper business that also of the ostrich feather making, "although the two trades are still usually independent of each other" (M. 2).

206. Although the total number of feather makers is comparatively small, "the "conditions of employment are for the most part very similar" to those of the artificial flower makers (M. 2, m. 44). The persons employed are, with few exceptions, females, the majority being under 25 years old. They begin at 11 and 12 years old (m. 44). The workrooms are "liable to being exceedingly hot and overcrowded," and the hours of work are, during the two busy seasons of "two or nearly three months twice a year," on an average from 8 a.m. to 10 p.m. The seasons are described as being from March to May, and from September to November, perhaps 10 weeks each time (m. 48). One witness, age 19 (m. 46), states that at one place where she had worked, and where 60 were employed, she worked "for several weeks day after day from 9 a.m. to 12 at "night; so did most of them;" also "in smaller places in outlying districts" children are employed and for long hours (m. 48). The meal times also are liable to be curtailed and irregular (M. 42, 43).

207. These facts prove that the ostrich feather manufacture comes within the same category as the artificial flower manufacture, and should be included in our recommendation in paragraph 181.

REPORT ON BOOTMAKERS, TAILORS, HATTERS, GLOVERS, &c.

208. In our Report on the Manufacture of Wearing Apparel we stated (2nd Report, ss. 312, 313) that it had reference exclusively to females, and that on a subsequent occasion we should inquire into the labour of male persons under 18 years of age occupied as boot and shoe makers, tailors, hatters, glovers, &c.

209. We proceed to direct attention to Mr. Lord's report upon that portion of the subject.

Number of children and young persons employed.

210. Taking the census returns for 1861 as the basis of calculation, and deducting two-fifths from the number of bootmakers, tailors, hatters, and glovers, between the ages of 15 and 20, as given by Mr. Lord in the table which he has constructed (O. 2) it would appear that the total males under 18 in those occupations in England and Wales approximate to 70,000. The numbers for Scotland under that age may, according to the census, be stated at 6,016, nearly all being of the two first-named trades, in about equal proportions. In the census for Ireland the ages are not given; but taking the same proportion as in Scotland, the number of male boot and shoemkakers and tailors under 18 would be 9,000. The number of females in all these four employments, in Scotland and Ireland is, according to the census, very small.

BOOTMAKERS.

BOOTMAKERS.

211. Of the total of 70,000 under 18 in the above-named four occupations in England and Wales, those engaged as boot and shoe makers amount, according to the same process of calculation, to about 45,000.

212. They are employed (N. 19–21)—

1. In factories.
2. In small workshops, where three or four journeymen with their boys work together.
3. In the homes of the journeymen.

Localities in which the manufacture is carried on.

213. The towns in which the manufacture is carried on in factories are London, Leicester, Northampton, and Stafford. In London as many as 200 men and boys are employed in some factories, and in Leicester and Nottingham as many as 300 (N. 5–7).

214. In each of these places a great portion of the work is given out either to journeymen working together in small shops, or to men working with their wives and children in their own homes.

Age.

215. Boys in factories often begin work "as young as 10, and even 9," but the majority not until they are nearly 11. Most boys who work for journeymen in their small shops, or at home with their fathers, begin at about 10 years of age, some probably much earlier (N. 5, 6).

Hours of work.

216. In the London factories the ordinary hours do not vary much from those of the Factory Act, and in Northampton, Leicester, and Stafford, they conform to them very closely, including the recognized factory hours for meals.

Overtime in factories.

217. But in London the ordinary hours "are frequently exceeded in the busy season "to the extent of from two to four hours, and for periods of from three to six months "in the year altogether" (N. 19). In the other towns overtime is much less frequent, and not beyond two hours, and for no long period together (*ibid.*).

Overtime in small workshops and private houses.

218. In the small workshops, and where work is done by the journeyman with his wife and family at home, "the invariable characteristic" is that much time is idled away at the early part of the week, and long hours consequently follow towards the end. This habit, and its injurious consequences, are described in the following evidence:—

219. Mr. Walter (N. 4):—

"We are liable to pressure now and then; for the last fortnight we have been working four hours overtime, but the men get fagged with it, and have asked for the future to knock off the two hours extra in the morning, and say they can get through nearly as much with two hours overtime as with four, so we shall try them. Our overtime amounts to about three months in the year, but not for more than a week or two continuously."

220. Mr. Thos. Hickson (n. 5):—

"The usual hours of work are from 8 a.m. to 7 p.m.; the overtime is optional, the doors being open at 7 a.m., and closed at 9 p.m. Such overtime lasts for three months in the summer, but the men cannot stand more than four or five such days in the week, though they prefer working hard for those days, and having one or two easy days in the week. They adopt in fact the principle of journeymen working as they do in their own homes."

221. Mr. S. Simon (n. 11):—

"I manufacture for the wholesale and the ready-made trade. At one time I employed a large number of persons on my own premises, but now I give most of my work out, and have here only the clickers (who cut out for the uppers), and a few girls who work sewing machines. I had nearly 100 girls employed here, but the greater part of them prefer to work at home, for there is a sewing machine in many families now.

"There are some few boys, apprentices, who work with the clickers. Their hours are from 8 a.m. to 7 p.m. with us, and that is long enough. In my opinion, overtime is unprofitable, as well as injurious to health.

"Where boys are chiefly employed in the boot and shoe trade is among the rivetters. A rivetter has two boys, of 12 or 14, who drive the nails in the holes which he makes; they also file the heads down. He pays them from 2*s.* 6*d.* to 5*s.* a week. It is among them that the habit of late hours of work prevails; it is nearly all home work. I tried having them here, but found that their habits were too strong for me. The men would not come in to work till 11 or 12 in the morning, and would not leave till 11 or 12 at night, so I gave that up.

"But those are their habits at home, and frequently there is nothing done on the Monday and Tuesday, and consequently they work very hard at the end of the week, the boys working the same hours that the men do, for they must go on together. It is wholly unnecessary. If they choose to work regularly from 8 a.m. to 7 p.m., for example, every day in the week, they could get through as much, and probably much more, and with less effort. As it is, many don't come here to take their work out till mid-day nearly, and others not till 7 or 8 in the evening."

222. — Presser (n. 14):—

"As to home work there is no knowing how long they work. In the low common kind of work, among the german slipper makers for instance, there is no end to the work, and no beginning either, just as much on Sunday as on any other day; they often go on till 11 p.m. Sometimes they don't get home from the shop till dinner time, and so don't begin to work till late, but the boys will be there in the morning.

BOOT-MAKERS.

"I began at stitch work at 12 years old, and worked all hours, from 6 a.m. to 10 p.m. constantly; I was not with my father, but with a journeyman who had no one else. Afterwards I was at a Polish Jew's; I was 17 then, he had three men besides his own family. I wouldn't work on Sunday, but often began at 12 on Sunday night. The boys who work at small places like that or at home are from 10 to 6 years old. There is no regular agreement; they are generally paid by the week; when I was with my first master I had 7*s.* a week, no more, however long I worked."

223. Mr. C. Parohl (n. 19):—

"This rivet work is ruining the boys in the trade, for all they learn is driving the nails and filing the roughness off. Finishing is bad work for health. My wife's nephew and his wife are in that. They often work from 4 a.m. till 11 p.m., and only earn about 23*s.* a week. It is all done at home. They sit close over the fire where the iron is warmed; and hurt their chests by pressing the heel of the boot against it in burnishing and filing. He wants to have a boy to help him; but I would not recommend any to take up that work. It is a common practice for finishers to work all Sunday, and they are in the habit of drinking a great deal of beer to keep their spirits up; for the sitting all day in one close room is very depressing."

224. Mr. Tribe (n. 24):—

"But there are plenty of boys working for journeymen in the boot trade who have to go on 16 hours a day. It is all bad management. Some of the fault is with the masters, who don't give out the work so soon as they might; but it is most the habits of the men, who choose to be idle for the first day or two in the week, and work on till 2 or 3 a.m. in the latter part. This is not peculiar to Brighton or any other place, it is the same all over the country.

"Boys are not usually apprenticed till 13 or 14, but may go much younger than that, under a sort of agreement at about 10. This boy here is 12. He has been a year with me, but they begin younger than that. I began myself at 9. I did'nt work so very long at first, for I was with a relation; but at 11 I used to work 14 hours a day for 5*s.* a week. Those are, in fact, the regular trade hours, 14 hours, with two hours out for meals. It is certainly too long for growing boys, particularly as they have to sit and stoop. Want of air and exercise is the bad thing. I have myself often laid on my back after leaving the "seat" quite unable to move. I learned to do this (showing a snuffbox) at 14 years old to keep myself awake at work."

225. Mr. J. B. Simon, manufacturer of Hardingstone, Northampton, also states to the same effect (n. 28,):—

"Rivetting is chiefly carried on in the factories; but finishing and closing almost entirely at their own homes. In the factories the average day is 12 hours, that is from 8 a.m. to 8 p.m., or in the summer from 6 a.m. to 6 p.m.

"In their homes there is no stated time, generally the early part of the week is wasted, and towards the close they are then obliged to work all manner of hours."

State of places of work.

226. The places of work, both large factories and the small rooms, in which a few journeymen work their boys, and the places where "garret" or home work is carried on, are thus described by Mr. Lord (N. 17–18):—

"The rooms where the clickers cut out material for uppers are, in most factories and workhouses, clean and light, in some recently erected they are even fairly ventilated. The rivetters are not so well off, their work-places, in London at all events, are frequently over-crowded, and usually close and dirty; one, which the foreman assured me, with pride, was the best in London, contained 216 cubic feet of air per head, and about 400 to each gas jet, and the contrivance for ventilation was of a very rude and ineffective character; yet, so far as my experience goes, the statement of the foreman was correct. The great heat of the gas is a constant source of complaint both in London and elsewhere (No. 422, p. 193, Second Report). Some have erred on the side of excess in ventilation, and bronchitis has been attributed to draughts arising from the size and height of the workroom.

"At the same time such places are very superior to any accommodation possessed by those who take work out, whether they work at home or, in the case of rivet work, in the rooms of middlemen, who let rooms to different journeymen. Their houses are described as 'miserable hovels.' Their workrooms as 'dreadful places, underground kitchens' (Nos. 4–13). 'With finishers this is even worse than with the rivetters or the seatsmen, for the work is more dirty, and stoves or gas gets, in which they heat their tools, are constantly burning on the low table at which they work 'packed as close as they can sit' (Second Report, Nos. 318,, 319, 421, pp. 167, 193)."

Education.

227. The evidence collected by Mr. Lord (N. 42–47), shows that the education of the young in this employment is in a very unsatisfactory state, and he calls particular attention that,—

"When the labour of a district goes on for the most part in the houses of the operatives, ignorance and disregard of education exist to a much greater extent than where the home and the work-place are totally distinct. Where the operatives meet for their daily labour in a factory, under a system of fixed hours, which controls their irregular habits, and if it admits of overwork, at least makes that also regular."

General characteristics of employment.

Should be placed under Factory Acts Extension Act.

228. The other general characteristics of this employment are well described by Mr. Lord (Nature of Occupation, N. 30–36), and, together with the details above adverted to in this report, lead to the conclusion that, in regard to those places of work which would come under the denomination of factories, this is a case to which the provisions of the Factory Acts Extension Act are plainly applicable; that no injury to the trade could arise from the limitation of the hours of work to factory hours; and that benefit to the health of the persons engaged in the trade would manifestly ensue from the sanitary inspection and regulation of the places of work in the manner pointed out by that Act, and also from the education clauses of the Act in regard to the young.

Tailors.

229. And with respect to the small workshops of the journeymen, and the "garret" or domestic work, we are of opinion that the general provisions which we have recommended in our Second Report (s. 465, C. Private Houses), in reference to the workrooms and "mistresses houses," and to the private houses in the lace trade, might with propriety be extended to this employment.

Tailors.

Age of boys when they begin work, and numbers.

230. At the east end of London, and generally where clothing is made by the wholesale and "ready-made" houses, tailors' work is done largely by females, in consequence of the increased use of the sewing machine. With these we have dealt in our Second Report. The west-end first-class houses employ very few youths under 18. It is in the country and where work is given out to journeymen that boys are employed, beginning sometimes at the age of 9 and 10, but usually about the age of 13 (N. 48–53).

231. There appear to be about 20,000 in England and Wales under 18 years of age (N. 2). The female tailors of all ages, dealt with in our Second Report (s. 414), amount, according to the census of 1861, to 27,386 of all ages, making a total of male and female, who would be included in legislation, about 47,000.

Either in small shops or in their homes.

232. The youths under 18 are found one or two together, either in small shops or employed at home by their parents (N. 48. 52.)

Overtime.

233. Although not universal, over hours appear to be very common in London among the journeymen during about six months in the year. At those times the boys work 15 and even 18 hours a day for several days together.

234. In some provincial towns the regular hours are 14 a day, and at times of especial pressure longer (N. 55).

235. The character and habits of the master, and also those of the apprentice and his parents, greatly determine those hours. Among them, Mr. Lord states (N. 55, 56):— "The irregular hours usually characteristic of home work are found to prevail, and, "as might be expected, to arise from the two most common causes; one being the "habit of the men to waste the early part of the week, and work hard at the end; the "other the practice of employers to avail themselves of that habitual irregularity when "any extra work is wanted at a push, so that work goes on till 11 and 12 p.m., or 2 a.m., "or as the usual phrase is, 'all hours'" (n. 38, 39).

236. This is universally allowed to be a bad system. "Ten or 11 hours a day is quite "enough for a growing boy," says one who has a son aged 15 working with him (n. 36). "I think," says another who speaks with a vivid recollection of hard work, "it would "be a good thing if all apprentices worked only from 8 a.m. to 8 p.m., and had an "hour for dinner out of that; it would be better for the lads, and no worse for the "masters; but they are curious men, and think it does a boy no harm to work too hard "for half the year, if he is nearly idle for the other half" (n. 37).

State of places of work.

237. The state of the work-places among the journeymen who take apprentices at the west end of London is said to be "wretched in the extreme." "The work at home," says one witness, "is very irregular, and the work-places very unwholesome; the majority "eat and sleep and cook and work in one room" (n. 31, 33). "The stench" says another, "is enough to knock you down; you go to the door, perhaps, and open it, but "shudder to go further into the room. There are hundreds of such places within five "minutes walk of this shop of mine" (n. 38. See Second Report, p. 148, No. 221). In such places several men often work together. In one case, Mr. Lord states, he "found seven under one man who took work out from a west-end house. These were "all crowded together in a back street near Golden Square. The owner of the room "was very proud of the accommodation, saying, as he showed me in, that very few had "a separate workshop thereabouts, but most used their living room for work and often "for sleep too. Similarly the witness, whom I have already quoted (n. 36), told me "without any hesitation, and apparently as a matter of course, that his apprentice, if he "could get one, would sleep in the workroom."

238. In another case, Mr. Lord found seven sleeping in the workroom (N. 57).

239. Dr. Edward Smith, in his report on the state of the "Shops" in London where tailors work on the premises of the employer (sixth Report of Medical Officer of the Privy Council), gives the following account of their sanitary condition (p. 419):—

> "Shops vary much in their sanitary conditions, but almost universally are overcrowded and ill-ventilated, and in a high degree unfavourable to health. Some are found underground, either in the basement of a house, or built like a large kennel in a small enclosed yard, and are such as no domestic servant would inhabit. A very few have been built as workshops for this or some other occupation, and have large rooms, with an abundance of windows. Some consist of a whole house with the walls

on each floor removed, a well staircase occupying the centre, and skylights placed in the roof of the upper room; others are simply rooms on the upper floors of the premises, and others, still, are single rooms, built in the rear of the premises, and lighted and ventilated from the roof only.

"In exceedingly few shops have there been any attempts at ventilation, except through the windows placed at the sides or in the roof; but in some, air bricks have been inserted into the wall, or a tube, with perforated zinc placed in its upper edge, and communicating by the end with the outer air, passes through the room, or tubes of various kinds pass perpendicularly from the floor to the roof. The ventilation through the windows is practically inefficient, since, when it occurs only through a moderate opening in the skylights, and the doors are kept shut, the interchange of air is but small, and when through a large opening in the skylight, or through side windows placed near the operatives, the draught cannot be borne, and some of the operatives insist upon their being kept shut. Such rooms are necessarily warm; but when the gas is lit, as during the day time in foggy days, and at night during the winter, the heat increases to 80° and even to upwards of 90°, causing profuse perspiration, and condensation of vapour upon the panes of glass, so that it runs down in streams or drops from the roof, and the operatives are compelled to keep some windows open, at whatever risk to themselves of taking cold."

Overcrowding.

240. The overcrowding is great even in "some of the most important west-end shops," of which Dr. Smith gives several particulars. The full force of the following remarks by Dr. Smith will be seen by comparison with the amount of cubic feet of space per head considered necessary by the medical officers of health, in London, for common lodging houses; namely, 300 cubic feet (p. L. of our Second Report; and sixth Report of the Medical Officer of the Privy Council, p. 529); while in places where persons are engaged in sedentary occupations, Dr. Sutherland states that not less than 500 feet of active ventilation per head should be allowed (*ibid.*).

"The amount of overcrowding will be properly estimated when it is known that the largest cubic space in these ill-ventilated rooms allowed to each operative and the gaslight is 270 feet, and the least 105 feet, and in the whole average only 156 feet per man. In one room with a gallery running round it, and lighted only from the roof, from 92 to upwards of 100 men are employed, where a large number of gaslights burn, and where the urinals are in the closest proximity; the cubic space does not exceed 150 per man. In another room, which can only be called a kennel in a yard, lighted from the roof, and ventilated by a small skylight opening, five to six men work in a space of 112 cubic feet per man. Such a state is, so far as my inquiries have yet extended, without parallel in workshops in other trades. As it exists in some of the best houses, men of good moral conduct and character must be found there; but my observation has led me to the belief that in the worst ventilated shops the men employed are of inferior moral character, and that the steady and respectable men avoid them (sixth Report of Medical Officer of Privy Council, p. 420)."

Recommendation of Second Report applicable to this case.

241. There appears to be every reason for applying to this case, as to the bootmakers, the recommendations above referred to in regard to "Private Houses," in s. 465 of our Second Report.

HATTERS.

242. Of hatters there are rather less than 2,000 under 18 years of age in England and Wales (N. 2).

Conditions the same as those of the bootmakers and tailors.

243. They usually commence work at about 11 or 12 years of age. They are employed, as the bootmakers and tailors, in large factories, in small workshops, and at home (N. 65). The "shops" are for the most part very close and ill-ventilated, many much overcrowded, especially in the busy time; some are extremely and unnecessarily dirty; and in others "the heat is very oppressive" (N. 75). The hours of work are "in the busy "season," which in London "is said to last for five months in the year," often long, "steady men working from 8 a.m. to 10 p.m.;" but others "till 11 and 12 at night." Mr. Lord states, "that in some well-regulated factories it is rare for work to be prolonged "beyond 13 hours a day in the busy time" (N. 77). In one factory, that of Mr. Hall, where the limit had been reduced, they found, according to the usual experience, more work done in 13 hours than was the case when they kept their "shops" open two hours later (*ibid.*).

Meal times.

Same legislation applicable.

244. The meal times for the boys are apt to be irregular and curtailed (N. 81). The conditions, therefore, being the same as those of the employment of boys and youths by bootmakers and tailors, we recommend that they should be included in the same measure of legislation.

GLOVERS.

Same legislation applicable.

245. The above remark applies also to the boys and youths employed by the glovers. The numbers under 18 years of age in England and Wales is about 1,000 (N. 2), but as they begin work at about 10 years of age (N. 86), are in some places liable to overhours, and to work in places where "the heat is at times very great," and in others which are "very small and close" (N. 91, 92), the same legislation is applicable as to

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the three employments last dealt with. The total number of females employed in the glove trade, and included in the recommendation of our Second Report, was 23,605 of all ages (s. 414), making with the males, stated above to be about 1,000 under 18 years of age, a total of about 24,000 males and females in the glove trade who would be included in our recommendations.

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Estimated numbers employed.

246. The census returns for 1861 do not afford the means of ascertaining the numbers employed in the manufacture. The estimates given by Mr. Lord in ss. 1 and 2 of his Report (O. page 142) lead to the conclusion that the numbers employed in the United Kingdom amount to about 100,000.

247. The returns received by Mr. Lord were from mills of various character, and in many parts of the kingdom; they may, therefore, be taken to represent the trade generally. They show that out of the total numbers employed about half were females, and that of the females just one fourth were under 18 years of age, of whom about one in six was under 13.

Number of females.

248. If this rule be applied to the presumed total numbers of females employed in the United Kingdom it will give 50,000 as the number of females employed, of whom about 2,000 will be under 13 years of age, and 10,000 between 13 and 18.

Boys under 13 few.

Youths between 13 and 18.

249. In nearly all the mills visited by Mr. Lord, "whatever the kind of paper "manufactured, there were some boys under 13 years old, but only two or three had "more than 12 such, and few more than six" (O. 5). It follows from Mr. Lord's returns, and the estimate founded on them of the totals in the trade, that the total number of boys under 13 in the trade is about 500, and the total number of youths between 13 and 18 somewhat under 10,000.

The processes of the manufacture.

250. The various processes in the manufacture of paper may be described generally as follows (Ure's Dictionary of Arts and Manufactures, 1861, p. 391);

1. Sorting the rags.
2. Cutting rags and other materials.
3. Dusting do.
4. Boiling.
5. Tearing or macerating.
6. Paper making.
   By hand.
   By machine—mills.
7. Paper cutting.

251. In the five first processes women and girls are chiefly employed; in the two last, men, youths, and boys. These and the few other subsidiary employments are well described by Mr. Lord in the fourth division of his Report, ss. 17, 34.

Mr. Lord's Report shows that it should be placed under the Factory Acts Extension Act.

The only question is, what modifications are requisite as to the hours of work for youths, and as to meal times.

252. The conclusion to be drawn from Mr. Lord's report and the evidence attached to it can be no other than that the paper manufacture is among those in which the persons employed may expect to derive the greatest benefit from the application of the general principles of the Factory Acts Extension Act. The only question appears to be as to the modifications that may be requisite to meet the peculiar conditions of the manufacture.

253. The points upon which the evidence leaves no doubt are the three following:

a.—The State of the Places of Work.

254. These are thus described by Mr. Lord (O. 12).

> "Some paper mills are very commodious, airy and clean in all departments; even the dust of the 'devils' being at all events reduced apparently to its minimum by means of fans, boxes, &c. Others, especially those of an older date, are very much the reverse; close, crowded, dirty and hot; contrivances to get rid of the dust in the chopping rooms, or of the steam in the making rooms, being either wholly inefficient or wholly neglected. In several places where news and other printing paper of a common kind was made, the dust was positively unbearable, the whole room being filled with a cloud so thick, that I could scarcely see the features of a person 20 feet from me."

255. It appears (ss. 14–15) that the difficulties in contriving proper ventilation under the circumstances are not great, and that there is no reason why the clause of the Factory Acts Extension Act which requires that "every factory should be kept in a "cleanly state, and be ventilated in such a manner as to render harmless, so far as is "practicable, any gases, dust, or other impurities," &c. (Clause 4) should not be successfully and very beneficially acted upon in this instance.

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b.—Fencing dangerous Machinery.

256. Mr. Lord states (O. 63) that he has seen shafts and driving straps in very dangerous positions; that serious accidents occur from horizontal shafting along the floor, and unfenced cog-wheels, especially where women work; that although crinoline and loose blouses or aprons are forbidden in some mills, several deaths and other injuries had been mentioned to him as having arisen from exposed machinery; and that although accidents are said to be much less frequent than they were "there is no doubt that "injuries of a more or less serious kind occur with sufficient frequency" to justify the conclusion that "fencing" machinery is as necessary in paper mills as in print works (O. 3).

c.—Education.

257. Although it has been shown above that few children of either sex in this branch of manufactures would come under the half-time system, still the deficiencies in general intelligence, and in the most rudimentary knowledge, exhibited throughout the evidence by many of the children found at work, make it manifest that to whatever extent the education clauses of the Factory Acts might take effect they would be beneficial. The objections of one or two of the witnesses, that in country districts with a scattered population there is sometimes no school within reasonable distance (o. 157) is not valid, inasmuch as such cases are provided for by ss. 38 and 57 of the Factory Act, 7 & 8 Vict. c. 15. Where so small a proportion of those under 18, of both sexes, are likely, as in this manufacture, ever to come under the half-time system, it is all the more to be desired that employers should encourage the attendance of the young at evening schools, if they are to be raised above the intellectual condition described by Mr. Lord (O. 81–84), which although "rather higher than the average found in some other employments" is still manifestly very low, and in no degree attributable to the poverty of the parents (O. 84).

258. The two points on which it may reasonably be urged that modifications of the regulations of the Factory Acts may be conceded, are—

I. The hours of work.

II. The regulation requiring children, young persons, and women to take their meals at the same time, and forbidding meals to be taken in any room where any manufacturing process is being carried on.

I.—*The Hours of Work.*

Day work the rule in the manufacture of hand-made paper in most of the processes.

259. In the manufacture of hand-made paper, in all the processes of sorting, cutting, paper making, rolling, glazing, and paper sorting, day-work and 12 hours are the rule. The exceptions are, occasional day and night shifts in paper making, and frequent night work in the "preliminary washing, beating, and grinding of the material." Overtime, although limited to the day time, is frequent in the processes of rolling, glazing, and paper sorting (O. 35–37).

Night work and overtime in some of them.

260. In the manufacture of machine-made paper night work is the rule in all the processes, except that of paper sorting (*ibid.*) and even in this it occurs occasionally (O. 49).

261. The night work in this manufacture is conducted under peculiar arrangements.

In machine-made paper night work the rule.

How conducted.

262. In some cases it is continued by relays without cessation through the week, usually from Sunday night to 12 on the following Saturday night; the change from the day to the night set being effected "by those in the day turn, working 5 days of "12 hours, and one of 18, and those on the night turn working 5 nights of 12 hours, "and one of 6 in each week" (O. 38).

263. In other cases "each set works 24 hours consecutively on alternate days" (O. 39), one set working 6 hours on Monday and 18 on Saturday to make up the 24.

264. An intermediate system prevails in some instances by which "those at the "paper-making machines attend for a working day of 15 or 16 hours duration every "day in the week," a system which, Mr. Lord remarks, seems to combine all the evils "of both the 12 and the 24 hours relay" (O. 40).

265. Both children, young persons, and women work under each of these systems.

Overtime where the 12 hours relay prevails.

266. Occasionally, though rarely, under the 12 hours relay, a youth, in consequence of the absence of his mate may have to work a double turn of 24 hours (O. 45). But the cases appear from the evidence to be of frequent occurrence in which both boys and girls make many hours of overtime, extending, in some instances, in the case of boys, to 24, and even 36 hours of consecutive work (O. 45–49).

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267. In the "continuous and unvarying work of the glazing room" girls of 12 are found working for a month together 14 hours a day, "without any regular relief or cessation beyond two, or at most three, breaks of half an hour each for meals" (O. 51).

268. Where night work has been abandoned as "is now wholly the case in some "mills," it has, "in some instances led to a great increase in the amount of overtime" (O. 54); and that often in the dirtiest, and in the hottest, and in the most monotonous of the various processes (*ibid.*).

269. When it is considered that these long hours of work for children, young persons, and women take place partly in rooms the atmosphere of which is loaded with dust, partly in other rooms in which the thermometer, even "in the best specimens" which fell under Mr. Lord's notice, stood at 90°, and in hot weather at 100°, "in the comparatively cooler parts of the room" (O. 13, 170), we apprehend that no further description of the conditions of work for females and for the young in this branch of manufacture is necessary to show that legislative interposition is required to bring the hours of labour of those persons into as near conformity with the hours of the Factory Act as the circumstances of the case admit. The evidence collected by Mr. Lord, and the exhaustive summary given by him in his description of the influence of the employment on the physical and on the moral condition of those engaged in it, together with the Report and evidence of Mr. Longe on the same subject (P. p. pages 178–180) will be found amply to justify this conclusion.

270. The following evidence comprises the opinions most favourable to legislative regulation, and to the adoption of the Factory hours.

271. Mr. Hayes, of Hemel Hempstead, a maker of superfine paper only, states (o. 152),—

"For my own part I should be rejoiced if night-work could be done away with, not on account of the men, for their health is very good; and where only men work there is no objection on moral grounds, but simply on account of the immense anxiety it occasions to the employers. I have myself to be constantly on the watch, staying up till 1 or 2 A.M., or getting up at 3 or 4 A.M. for fear of accidents or damage. I must admit that we have never had any accident at night, and we have had some in the day; but still I think night-work dangerous and scarcely profitable."

272. Mr. J. MacMurray, of Wandsworth, a maker of only news and general printing paper, states (o. 108),—

"I must say for my own part that I very much dislike and disapprove of this night-work. It is not that the physical effects are bad; at all events out people are all wonderfully healthy while they are working for us; but I think the moral effect is by no means good. So far, indeed, as the working of the two sexes in the same room at night, we have been very fortunate; but from a social and even a sanitary point of view, it operates badly, and this more on the families of the men than on the men themselves. It frequently happens that all or most of the members of a family work for us; some being on in the day and some in the night; the consequence is that one is no sooner out of bed than another gets into it; that is most unwholesome. Then, again, the girls here often marry the young men whom we employ, and remain in our employment; they have no time for domestic duties, so that their rooms are rarely cleaned, and if not overcrowded by their own families, they make them so by taking lodgers; of course other people than paper-makers have dirty and overcrowded dwellings; but these are in a special way, as it were, tempted and almost forced to do so. I notice the bad effects in the pale, sickly faces of the children who bring the food here sometimes for their parents or elder brothers or sisters.

"Besides this, the men themselves have no time for education and self-improvement, while for the younger ones it is far worse; they have not even time for play, which they want as much as learning, or they take it out of the time for eating and sleeping; but they ought to have time for all these. Here is one instance; that young woman who is 'catching' there cannot read.

"The fact is, people ought to be made to have the day for work and the night for rest. My own conviction is, though I believe that very few employers in our trade agree with me, that if a general act were passed to prohibit night-work altogether for male adults as well as for women and children, it would be a benefit to the trade; the quantity produced would be lessened, and their prices would rise, or more capital would be invested and plant laid down. Foreign competition then, no doubt, enters into the question so far as certain classes of paper are concerned; but I think that is more used as an argument than feared as a danger.

"No doubt also there is loss from stopping, or rather from starting afresh; waste both of fuel and material. After we shut down on Saturday everything gets cold by Monday morning; we do not work out the contents of our troughs, but leave them, as they happen to be, till the Monday. There is the extra consumption of fuel before the whole gets into working order; the contraction and expansion of the cylinders, boilers, and other parts of the machinery, which actually injure the latter, and, in the first-mentioned case, by altering the speed of revolution, cause the greatest trouble; thus the consequent waste of pulp and the amount of bad paper made at starting are astonishing. I assure you our trouble every Monday morning is nearly enough to drive one cracked; and if I were not here from the very first at midnight, and constantly looking after this one or that one till we are fairly started, I think we should never get off at all. However, in 12 hours they would not get so cold as they do in 24, from Saturday night to Sunday night. Some time ago we had to shut down repeatedly for eight hours at a time for several weeks, and never had any difficulty in starting after that interval.

"With regard to health, I am often surprised at our men; some who have been 14 or 15 years here have not been absent for a day from illness or holidays. But I am very strict; no beer is allowed here on any pretence, and no irregular person stays with us. At the same time I am not so sure that we are right in inferring that the night-work does not hurt them because they are apparently strong and healthy now. It is all very well so long as they are young; we don't notice how it happens with them as they get old. It is more than probable that there comes a time, all of a sudden, when they go down like a shot, because they have been living unnatural, artificial lives, and have no real strength to resist disease or decay."

273. Mr. Allnutt, junior, maker of coloured and fancy papers only (not tissue) for covers of publications, albums, cheques, and the like, states (o. 55),—

"We have no need to work at our paper-making machine longer than from 6 A.M. to 6 P.M., for in that time we can work up all that our beating engines can do in the 24 hours. Our machine does not work very fast; some kinds of paper may be made three times as fast as ours.

"If we had twice as many beating engines as we have, and wished to keep them all going without having any more paper-making machines, we should have to work the latter day and night also. Night-work at making paper is a mere question of the proportion of beating engines to paper-making machines. My father has always had a strong dislike to night-work; the men get sleepy and careless; and as a consequence the loss from damage to material or to gear, which probably would not have happened in day time, is considerable.

"Our cutting machine, and even our drying cylinders are separate from the machine where the paper is made. We can always cut at this machine in 12 or at most 13 hours as much as all our machines make in the day. The cylinders ought not to be away from the other part of the machine, but we were forced to make the best of the premises which we had."

274. Mr. J. B. Green, maker of paper by hand, chiefly bank notes, cheques, and similar kinds, states (o. 70),—

"The length of hours is caused by our having only one pair of glazing rollers; we ought to have two."

275. So also Mr. Busbridge, of East Malling (o. 48),—

"One cause which to some extent necessitates working in the machine room beyond the usual hours is that our pulp must be worked out in the day, which our rag engines produce in the 24 hours, or else the supply would accumulate and be in excess; and the time for working the stuff produced will, of course, depend on the thinness and the making width of the paper on which the machines happen to be engaged, the engines for producing pulp being inadequate to supply quantities for keeping the machines continuously at work for 24 consecutive hours."

276. But even those employers who are most alive to the evil results of night work hesitate to acquiesce in its being put an end to by law, while by the trade generally such a proposal is looked on with very general disfavour (O. 86).

277. Mr. J. B. Green, above quoted, believes that the prohibition of night work "would be absolute ruin to many branches of the trade," and he suggests that it might be continued under a system of three shifts of eight hours each.

II.—*Meal Times.*

278. Another modification of the regulations of the Factory Act, if applied to the paper manufacture, is strongly urged in the course of the evidence, namely, the relaxation of the rule requiring the meal hours to be at the same time for all, and of the further rule that the meals should not be taken in any room in which any manufacturing process is then carried on. The following facts show that the necessary stoppages in the course of the various processes are so frequent, and to such an extent as to justify this claim on the part of the employers. They prove at the same time, and the summary of the evidence on the question of meal times given by Mr. Lord (O. 55–59) strongly confirms, the necessity of securing to the children, young persons, and women the full amount of the factory hours of meals, viz., an hour and a half per day.

279. Mr. T. H. Saunders, Dartford, states (o. 40)—

"The time consumed by necessary stoppages varies so much in different mills, and in the same mill on different classes of work, that it is impossible to give any average. With some papers felts are washed every week, with others every other day. We often don't change sorts for 48 hours."

280. Mr. Busbridge, East Malling, states (o. 48),—

"The machines are only worked by day, and not night and day continuously, so that it is very difficult to give a fair statement of the extent of their overtime; for although three boys are always in daily attendance at each mill in case that they might be wanted, it frequently happens that only one is actually at his place; the others may be reading, or cleaning up, or fetching the men's meals, or having nothing to do. The fact is, that in the machine and engine rooms of a paper mill the work is in no way continuous for man or boy, though they are paid for all the time during which they attend. For example, the boy Albert Smallwood appears from the wage book to have been paid since the beginning of this year for five weeks of 80 hours a week, one of 85, three of 90, two of 92, and one of 100; in others only 70, 60, or 50. Now, it is very probable that he has been at the mill when business has been pressing during 15 or 16 hours in the day, and paid for that time accordingly, but that does not represent the hours he was at work, for half the time probably he was not at work at all; and when the machine is stopped, as it frequently is for repairs of one kind or another, and also to mend the felts or wires, or merely for changing sorts or sizes, he may help the man by fetching or carrying something, but otherwise would be resting."

"The last-mentioned cause of stoppages is one which affects mills that vary much in the kind of paper produced, and execute small orders or limited quantities of peculiar or particular paper much more than those who make nothing but news or printing paper for large orders or for a constant supply, and may work 48 hours and more without one change."

281. On this subject Mr. Thomas Wrigley, Bury, states (o. 159),—

> "We could not manage so as to stop the machines for meal times; it would take at least half an hour to get the cylinders hot again if we stopped in the machine room. Besides the delay and loss of time, there is a positive loss in waste of pulp and broken paper. Whenever from any cause, as it is, a paper machine has to be stopped, all the pulp must be washed off the wire, and the wet sheet scraped off the roller, and the sheet upon the cylinders breaks; then in starting afresh the pulp has to be led by the hand on to the wet felt, and thence again to the dry felt and through the presses. Again one uniform heat can be easily maintained, but is difficult to be got at once; if the cylinder is too hot, the paper snaps; if too cold, it is damp. We have 11 paper machines, and each machine has from six to eight cylinders; in other places each may have 10 or 12, and more; all the cylinders must be at exactly the same temperature before a perfect sheet can be made. At least a quarter of an hour is lost, and a corresponding quantity of paper spoiled every morning by each machine before they make a fair start. Even in the meal gathering up after a breakage, while the machine is going all the time, 30 or 40 feet will be destroyed. I am not able to give you any satisfactory estimate of the value in money of the loss which stoppage for meal times would involve; it would be very considerable."

282. The opinion of Mr. Horrocks (o. 170) that they could adopt Factory regulations, "meal times and all," is shown by the postscript to s. 181 to apply to an exceptional case in the trade.

283. With regard, therefore, to these two questions of the prohibition of night work and the regulations of the Factory Act in respect to the meal hours, it may be taken as true as to the former, that, in the words of Mr. Allnutt and other witnesses (o. 55), night work at making paper is a mere question of the proportion of beating engines to paper-making machines, and that it might be obviated in that process by a larger outlay of capital; also that in the other processes the objects might be obtained by an extra expense in an increase of machinery and of wages. But it is manifest that under the present circumstances of the paper manufacture, however individuals might be able to meet such additional outlay with profit and advantage, it would be inexpedient to place a strain to that extent upon the trade. We are of opinion that the circumstances of this manufacture would be sufficiently met by the following measure.

Modifications recommended.

284. This manufacture to be placed under the Factory Act Extension Act, subject to the following exceptions:

1. Youths between the ages of 16 and 18 may be employed at night, but only in shifts of eight hours each, beginning respectively at 6 a.m., 2 p.m., and 10 p.m.
2. So much of the Factory Acts as relates to the taking of the meals at the same time, and to the prohibition of meals being taken in any room where any manufacturing process is then carried on, not to apply to the paper manufacture; and so much of the said Act as requires one hour and a half to be assigned for meals, not to apply to youths who work in eight hour shifts. Youths who work in eight hour shifts to have half an hour for meals before the end of the first five hours of work (13 & 14 Vict. c. 54. s. 2).

285. These modifications accord in principle with those conceded in the case of the lace manufacture, and also temporarily in that of the paper stainers, to which the case is very analogous; but it appears to us that the nature of the processes in this manufacture require the modification as to meal times, as well as in regard to the employment of youths between 16 and 18, to be permanent.

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Departments of glass-making.

286. The manufacture of glass consists of the following principal departments:—

Plate.
Crown.
Sheet.
Flint, and
Bottle-glass.

287. The manufacture of *crown glass* is gradually dying out, being superseded by sheet and plate glass, the production of which has very greatly increased since the abolition of the excise duty on glass in 1845. The manufacture of *plate glass* was first introduced into England in Lancashire in 1771. To Mr. Chance, of Birmingham, and Mr. Hartley, of Sunderland, we are indebted for the introduction into this country of the manufacture

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of *sheet glass*, which may be said to have given a new feature to our public and private edifices (q. 237). The process of Mr. Chance was perfected in 1838. The manufactory of Mr. Hartley, of Sunderland, produces nearly one-third of the sheet glass made in England.

288. *Flint glass*, the "crystal" of the ancients, is supposed to have been made in this country at and near Newcastle-on-Tyne, as early as 1616. The manufacture is divided into two branches:—

Blown, made by manual labour.
Pressed, made chiefly by machinery.

Distinction between glass making and glass-house work.

289. *Glass bottles.*—These can be made wherever lime and sand are found (q. 237), in places of work varying from the largest scale (q. 177–214) down to some purely domestic (q. 124, 125).

290. In completing some kinds of glass for use, as in polishing and cutting up plates or sheets of glass and "cutting" or ornamenting flint glass, an entirely distinct class of labour is used, and in work places more or less separate (Q. 14). This distinction between glass "making" or glass-house work, and subsequent processes, has an important bearing upon the questions about to be submitted for consideration.

Numbers of children and young persons employed.

291. The returns obtained by Mr. White of the number of children and young persons employed in the above branches of the manufacture, with his estimates thereon, checked by the census returns of 1861, afford the means of making a very close approximation to the exact number, which will be arrived at by adding to Mr. White's Table (Q. 31) three-fifths of those in the census table as between 10 and 15, and 15 and 20 respectively, for those employed in Lancashire (Q. 32, 33). The total number therefore of children and young persons of both sexes employed in the glass manufacture will be as follows:—

———	Children, Male and Female.*	Young Persons.†
According to Mr. White's Returns and Estimate (Q. 31) - -	780	2,473
Add for Lancashire (Q. 32) - - - - -	261	420
	1,041	2,893
Total Children and Young Persons - - - -	3,934	

* Nearly all males. † About nine-tenths males.

Females above the age of 18.

292. Of females above the age of 18, there are employed in this manufacture, in England and Wales, according to the census of 1861, about 1,600 (Q. 32). If to these are added the females above that age employed in the glass works of Scotland and Ireland, the total number of children, young persons, and women engaged in the manufacture in the United Kingdom may be stated at a little above 5,000.

Age of children and young persons.

293. Mr. White states (Q. 23) that the age at which the youngest children usually enter glass works is from 9 to 11; in most instances "the mass now at work are over 10." In Messrs. Chance's works, Birmingham, "there is a rule against any boys being employed "under 12;" and Messrs. Pownall, a leading London firm, "have for many years "enforced a rule against employing any under 13." Several other masters have a "dislike to boys below those ages." In flint glass cutting-shops "boys do not begin "younger than 12, and usually 14, except a few who come as mere attendants" (*ibid.*). Nearly the whole of the children are males (Q. 31). Of the young persons employed about nine-tenths are males (*ibid.*).

State of places of work.

294. The state of the places of work occasionally renders the labour of the boys unnecessarily irksome. In consequence of the faulty arrangements of furnaces and kilns they are sometimes placed literally "between two fires." Some flint and glass works built "with the old construction of cones" are also very hot. There are frequently strong draughts close to where the boys work, bringing a large amount of dust, with which their faces become begrimed. The new houses, especially those at the largest manufactures, are comparatively cool, airy, and clean (Q. 39, 41).

High temperature.

295. In some work, as in crown and sheet glass-houses, the boys are "almost permanently "in a high temperature;" the hottest being that of pushers in crown glass-houses, and of shovel-holders in sheet glass-houses, "work done by the youngest boys." Mr. White says, "The heat in which the little shovel-holders stand is very great, at first I could "hardly bear to go up and stand in their places" (Q. 46). In one case Mr. White found the thermometer, held close to the boy's head, to be 130°. Mr. White adds that while he was standing near for that purpose, his hat, both crown and brim, melted so out of

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shape that it was unfit to wear until restored by a hatter (*ibid.*). In a flint glass-house, his thermometer at the mouth of a kiln where boys put in articles to anneal, "standing " there, however, each time only as they set down the articles," rose quickly to the top, viz., 150° (*ibid.*). In bottle works the kilns or "arches" are ovens, "much like large " ovens in a wine cellar" (Q. 47). These are entered by boys to remove the bottles. The heat was found by Mr. White to vary from 106° to 120° (*ibid.*) A boy, 11 years old, "a taker-in" on being asked by Mr. White how the hair on his forehead got singed so, said "It's the heat of the arch, sometimes it swinges my clothes too, if the wind " draws much" (q. 213).

296. Of these arches Mr. White speaks as follows (Q. 48, 49) :—

> "The arches have no communication with light or air except the openings, sometimes a door, sometimes a mere hole, which must be climbed through, through which the bottles are taken out. From this cause, and from the fire which has been for some time previously burning in the arch to heat it, the air no doubt, as I was informed by a medical gentleman that it does, becomes deficient in oxygen, and therefore more exhausting to work in.
>
> "I consider that arches are places altogether unfit for girls to work in, or for young boys, at least, for more than a very limited period. It is, indeed, only in some cases that drawing forms more than a portion of a day's work. 'It would not be at all healthy.' Would be 'quite improper,' says the manager of some large works." (No. 183.)

Ventilation and cleanliness required.

297. In many cutting shops in flint-glass works attention to ventilation and cleanliness is much required. "Putty powder, of which lead is the chief ingredient, is used in two of " the finishing processes," and flies off plentifully. "A certain amount of sharp particles " are also thrown off from the glass, which also contains lead, and from the stones or " cutting wheels themselves, of which one kind consists of discs containing lead" (Q. 57). The sheds also in which boys grind, and those in which women and girls smooth plates or sheets of glass are "in some cases sloppy from the water used in these processes," a defect which could easily be removed (Q. 54). "Owing chiefly to the above causes " flint-glass cutting shops are generally regarded, both by employers and workmen, as " much less healthy as work places than glass-houses are" (Q. 59).

Amount of work done by boys in these places.

298. Such being the ordinary state of the places of work as regards temperature, ventilation, and cleanliness; the amount of work done by boys, youths, girls, and women in the course of their daily or nightly spell of labour is certainly extraordinary.

299. The arrangement of the work between the men and the boys in the glass-houses is thus described by Mr. White (Q. 61–63) :—

> "In all glass-houses men and boys work in sets. In flint-glass houses the set, or 'chair,' as it is called, consists usually of four persons, viz., the head man, or 'workman,' the second, or 'servitor,' the third, or 'foot-maker,' and the fourth, or 'taker-in.' Of these, the taker-in is nearly always a boy, and usually under the age of 14 or 15; the foot-maker, sometimes a boy, and sometimes a man, but nearly always over the age of 14 or 15; the servitor is occasionally, but very rarely, a boy; and the workman nearly always a man of full age. In some kinds of work the set consists of more hands, and in pressed flint-glass work another young boy or two is usually wanted. In inferior kinds of work in smaller places the set consists of fewer persons, say, two men and a boy.
>
> "In bottle-glass houses the set, or 'hole,' as it is called, from working at the same hole or mouth of the furnace, consists usually of five persons, viz., the bottle maker, or finisher, the blower, the gatherer, the putter-up, and the taker-in. Of these, the last is a boy of the same age as in flint-glass houses, the putter-up, a boy rather older, the gatherer, a boy or youth, and the two top hands nearly always men. Each furnace has several holes or mouths, usually only one to each pot. The common number of pots to each furnace or house is four, in some six.
>
> "In other kinds of houses the proportion of boys is much smaller, and they are more strictly mere helpers."

300. The greater part of the boys' time is spent in carrying glass to and fro to the annealing kilns, in carrying and clearing the men's irons, and helping them in various ways. The boys' attention is constantly kept up, and they are in "almost constant " motion." But, apart from the bodily exertion in lifting and carrying, "the mere distance "travelled in a day's work is surprising" (Q. 68, 69). This amounts, in bottle and flint-glass houses, according to Mr. White's careful inquiries, from an average of 15 and 16 to nearly 20 miles in their "day" of 6 hours (Q. 70, 71).

301. The other department of work in which boys are employed, as described (Q. 73, 80) are both laborious, and often in a very high temperature, and such as to cause "a " severe strain on the bodily powers of young boys" (Q. 67).

Hours of work.

302. "The hours of work in glass-houses of most kinds are very peculiar and varied; " being mainly governed by one common principle, namely, the length of time which it " takes to prepare and work out the given quantity of metal which it is found expedient " or practicable to manufacture at one time" (Q. 88). The "journey" in crown, sheet, and bottle glass-houses usually begins as soon as Sunday is ended. The working journeys take in sheet glass houses "from 8 or 9 to 10 or 11 hours; in crown houses an " hour or two longer, and in bottle houses from 9 or 10 to 11 or 12, and in some cases up

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"to 14 or 15 hours" (Q. 91). "Hence these journeys fall in either the day or the night, "or more often partly in both, just as it happens, beginning after Monday at no definite "hour, but just when the metal happens to be ready for working." Most of the remainder of the time is spent in the preparatory process, including filling in the metal, founding, and settling (*ibid.*).

303. Mr. White observes (Q. 93) that as regards hours, each principal furnace is independent and complete in itself, as if it were a separate manufactory.

304. In these crown, sheet, and bottle glass-houses "it is said to be impossible to "secure any regularity as to hours," although uniformity is approached just in proportion as the establishment is in good working order, or the management efficient. But neglect or defects anywhere are liable to hinder the work (Q. 94).

305. In most blown flint glass-houses, however, there is a uniform system of work by relays or "turns" of six hours each, day and night, from the time of beginning to work the metal till the time that it is worked out, this taking so long a time that relays are necessary; on an average four days and four nights, usually beginning at 6 or 7 a.m. on Monday (Q. 96). In very small works the relays are of 12 hours (q. 85, 122–126, Q. 117.)

306. In pressed glass-houses in the north of England, two sets of glass makers work in relays in the same way, but in turns of eight hours instead of six (Q. 97).

307. Of the six hours relays Mr. White says that it is "unfortunate for the boys." (Q. 100).

> "During the working part of the week six hours is the utmost unbroken period ever attained at any one time for rest, and out of this has to come the time spent in coming and going to and from work, washing, dressing, and meals, leaving a very short period indeed for rest, and none for fresh air and play, unless at the expense of the sleep necessary for young boys, especially at such hot and fatiguing work. If the usual week were extended to the five days, contemplated as possible (No. 96), this would take away some of the time which the boys now have for rest and play at the end of the week, while it increased their labour. Even the short sleep is obviously liable to be broken by a boy having to wake himself, if it is night, or by the noise if it is day." (Nos. 120–127.)

Abuses of boys' labour.

308. In addition to the average hours of work given above as those in the crown, sheet, and bottle glass-houses, another demand is made upon the boys in their being required to come one, or two, or three hours before the men "to get things ready for "them," and also to stay from a few minutes to half an hour after the men leave "to "clear up." This, Mr. White says (Q. 101), makes the boys' work amount generally to about 12 hours, or often to 13, 14, or even 15. In flint glass-houses, also, boys sometimes come half an hour before the men to get things ready.

309. On this flagrant abuse of boys' labour in connexion with such laborious work as they have to go through, and in such great heat, in the ordinary process of manufacture Mr. White observes that "there is nothing in what they do" in this extra time "which "could not be equally well done by men" (Q. 102.) It is satisfactory to find that this is so, because it appears that "if only this excess of the boys' work over the men's were "cut off," the difficulties would be "slight" in "restricting the work of boys in the actual "glass making" (*ibid.*).

310. It appears, also, that another abuse of the labour of boys exists in the crown, sheet, and bottle glass-houses, in the occasional practice of taking a boy from one house to supply the place of a boy wanted in another, "so that a boy has gone six journeys in "a week" (Q. 106). Many instances of a similar nature are given by Mr. White, in one of which a boy worked 36 hours together; in another case, "a boy 12 years old, who "works as a drawer in very large bottle works, from 5 or 6 a.m. till 6 p.m. had to 'take "in,' in place of a boy who was away, till 2 a.m., and then slept in the furnace till 5 a.m. "when his next day's work began" (*ibid.*). Where work is continuous, as in this manufacture, day and night, it is almost inevitable that instances of boys taking the place of others who are absent from various causes must be of frequent occurrence. More especially is this so in flint-glass works, in which the working of the metal goes on "uninterrupted" (Q. 108). In this branch Mr. White adds, "the length of time for "which some boys have to work is wonderful" (*ibid.*). And an "unavoidable opening" is given to this wherever boys work in night relays at all; there being also two strong inducements operating upon the boy to do so,—first, that his absence would throw out the work of the "chair," or set of men "with whom he works"; and secondly, that the money so earned is the only money he has for himself, except the few pence usually allowed him by his parents out of his wages (Q. 109).

> "A single turn 'over' on the system above described involves 18 hours' consecutive work, followed only by six hours' rest for sleep and meals, and this subject to the other deductions noted above. (B. 100.) One or more turns 'over' are often made by a boy in a week, frequently three, sometimes more. A boy who has himself worked in this way 36 hours without going to bed, speaks of another who would work for 60 consecutive hours, come on a Monday morning, say, and work straight on to 'Wednesday

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night without going to bed' (No. 69). Another has worked eight turns over in a week, which cannot imply less than 120 hours consecutive work, less two intervals of six hours each for rest. (No. 73 and note.) Another has worked as many as seven turns running, and five turns running 'often' (No. 74)." (Q. 110.)

311. In the small flint-glass houses the effect is still greater. In these (Q. 111, 112):—

> "Working the 12-hour turns, a single turn 'over' entails, of course, double the amount of work which it does in the six-hour turn houses, viz., 36 hours, and this is not unfrequently done. A man, now 36, who began the trade at eight years old, says, 'Many a time, even while I was a boy, I have 'been on 48 hours at a time, in those small places, till I could hardly hold my eyes open, and I have 'been that way so as I couldn't sleep because I was over tired. I was forced to do it' (No. 130). A boy when about 12 years old worked five turns, or about 60 hours, running, with a break of six hours, *i.e.*, from 7 on Saturday morning till 7 on Monday evening, making glass on the Sunday (not minding a furnace), except from 1 to 7 p.m., when he was fetched back just as he was getting to bed, a bigger boy having run home. On the faith of his expected Sunday night's sleep, he had spent his time in playing instead of rest. 'Didn't like it at all. Was so tired I could scarcely stand up' (No. 133). Another says, 'Have worked 36 hours together, *i.e.*, one turn over, but never more at any time. May 'do it twice in one week perhaps' (No. 131). A boy 10 years old has worked from 7 Friday morning till 7 Saturday evening—'Lay down a little on anything I could;' and at a former place often half turns over, making from 7 a.m. till 1 a.m. following, sometimes three times a week (No. 138). In all these cases of long hours it is important to bear in mind the amount of exertion noticed above as often required.
>
> "In some of these small flint-glass works in London, boys 'stoke' or take charge of the furnace, with or without other work, for turns of 12 hours. At one place a boy had to do this besides his week's taking-on, in alternate Sundays, another boy taking the alternate Sundays, 'Got 1*s.* for it, and all my 'grub.' Another does it for seven nights, another for six" (Nos. 130, 131, 133, 136).

Overtime in the grinding and polishing rooms.

312. In plate and sheet glass grinding and polishing, Mr. White states that overtime is the rule, although not extreme in any one day; the day's work amounting, however, in many cases to 14 and 15 hours for months together (Q. 115).

Meal-times not observed.

313. A consideration of the evidence in regard to meal times in the glass manufacture shows that in the great majority of cases in all branches of the employment, there is no real obstacle to the allowing children, young persons, and women proper and salutary intervals of rest required for meals. In a few of the departments of the manufacture the nature of the work interposes a difficulty, but not such a one as is insurmountable, either by better arrangements, or in extreme cases by the employment of a few surplus hands (of which there is a large number in the trade, Q. 156) to take the place of those who are resting for their meal time.

314. And that these intervals of rest are more particularly demanded in the interest of the young and the feeble in this manufacture, cannot fail to have been observed from the facts already adduced in regard to the temperature in which the work is carried on, the extraordinary exertion required in so many instances, and the night work which is the common condition of the manufacture.

Certain intervals for meals should be secured for children, young persons, and women.

315. It is plain from the shifting nature of the turns of work that the ordinary regulations of the Factory Acts in regard to meal times are not applicable. But it may fairly be required that the principle involved in that part of the clause relating to the meal times which requires that, "No child, young person, or woman can be employed more than "five hours before one o'clock without an interval of thirty minutes" (7 Vict. c. 15. s. 36., 13 & 14 Vict. c. 54. s. 3.), should be applied to the glass manufacture, and consequently that intervals of half an hour, amounting in the aggregate to one hour or one hour and a half, should be secured to those persons according to the length of their turns of work.

Meals should not be taken in rooms where arsenic or lead are used, or in the polishing rooms.

316. In the rooms in bottle-glass works where arsenic is used in mixing, in the mixing rooms of flint glass where lead is one of the materials, and in the flint glass cutting and polishing shops the meals should not be allowed to be taken (Q. 42, 43, 54–58, 162).

Need of intervals for rest or meals.

317. In one instance quoted by Mr. White it appears that the men lie out by turns for their meal time, "but they do not give the boys that privilege." Doubtless such cases are not uncommon. That a single one should have been noticed is sufficient to suggest the need of securing for the weak what the strong take for themselves. And as to the possibility of some slight amount of loss arising from the necessity of giving to the boys, young persons, and women, the amount of rest that is their due for meal times, Mr. White makes the following important observations (Q. 125):—

> "A certain amount of heat beyond what is usual at present might also be going to waste," if meal-times were secured in these cases, "but it seems likely not equal in money value to the waste of animal power now going on in glass-houses throughout the kingdom from growing boys not having enough quiet time to eat their meals at ease, with a little rest afterwards for digestion. Anyhow, it cannot be doubted that glass-house boys undergoing such labour as many of them do, for their own well-being, imperatively require more or longer intervals in the course of their work than many get. Glass-house work requires a great amount of support'" (Nos. 59, 180).

Effects on physical and

318. That these united causes should have very bad effects on health, and also on the moral and intellectual state of the young might be anticipated from the description we

moral condition.

have given of the general conditions of the employment. The evidence on these points, as summed up by Mr. White (Q. 146–180), is conclusive upon both.

Complete details on all points given by Mr. White.

319. On these as well as on all the other portions of the subject which we have dealt with above, the Report of Mr. White is so full and satisfactory and involves so much detail, that we have only thought it expedient to give by its assistance a brief outline of the facts sufficient to show the grounds on which the conclusions from the whole report and evidence rest.

Mr. Lord's Report on Glass works in Lancashire leads to the same conclusions.

320. We beg also in this place to direct attention to the short report and evidence by Mr. Lord (R. r., pages 266–277) on the glass works of Lancashire, as in all important respects coinciding with and confirming the facts adduced by Mr. White, and the conclusions deducible from them.

Conclusions and recommendations.

321. The protection of the Factory Acts Extension Act is manifestly required in this case, in reference, as has been seen, to the state of the places of work in a sanitary point of view; to the excessive and unnatural hours of labour, generally in great heat; to the absence of proper rest for the young during meal times; and to the improvement of the education of the young. It is also necessary in relation to the fencing of dangerous machinery (Q. 140), and for the purpose of requiring a medical certificate of physical fitness for work so laborious and exhausting (Q. 186), as ordered by the Factory Act for all under 16 (7 Vict. c. 15. ss. 9–15.).

The points for determination.

322. The very exceptional nature of the glass manufacture involving as it does many various and complicated details, makes it difficult to determine what the precise regulations should be in respect to the following points,—the age at which children should commence work; the extent to which the half-time system is applicable; and the age at which youths should be allowed to work full time.

Recommendations.

323. We are, however, of opinion that the evidence justifies the following recommendations, as securities against overtasking the strength of the young, and as extending to this manufacture the principle of the beneficent regulations of the Factory Acts, as far as the circumstances of the manufacture admit.

As to work *in* glass-houses:—

1. No female to be employed in any process of manufacture in a glass-house.
2. All boys to be excluded from working in glass-houses until they attain the age of 12 years.
3. From the age of 12 to the age of 16, boys and youths may work between 6 a.m. and 8 p.m., but not on the whole more than 12 hours in any one day, including intervals for rest or meals amounting in the whole to not less than one hour and a half (q. 233).
4. From the age of 16 to 18, youths may work between 8 p.m. and 6 a.m., but not more than eight hours, with intervals for rest and meals amounting in the whole to not less than one hour (q. 158, 163, Q. 187–189).
5. No youth between the age of 16 and 18 to work between 8 p.m. and 6 a.m. otherwise than in alternate weeks.
6. Where any accidental delay has occurred in any of the processes, boys and youths may be employed for any time not exceeding one hour after the hours above specified. (Q. 198.)
7. Boys and youths below the age of 16 employed in the "making" houses in glass works, to attend school for not less than nine hours in each week, at not less than three different school times, either in the morning, afternoon, or evening.

All other boys in glass works to attend school according to the regulations of the Factory Acts.

As to work *out of* glass-houses:—

The regulations of the Factory Acts Extension Act to be applied to the processes of grinding, polishing, and cutting plate and window glass, and to the cutting of flint glass, and to all the branches of work done in the course of the manufacture of glass out of glass-houses.

324. We believe that if these recommendations should be embodied in legislation, they would operate as satisfactorily as the regulations of the Factory Acts Extension Act have been found to do, in the case more especially of the potteries, and of the other branches of manufacture included in that Act.

Brick-making the only con-

325. Of the trades and manufactures which we mentioned in our Report of last year as then to be completed, the only one now remaining, of any importance, is that of brick-making, the inquiry into which can only be conducted during the long days of summer

The Glass Manufacture.

and autumn. It will be completed in the course of this autumn together with a few other subjects of small extent which we found to require notice.

326. Our Commission having been recently extended to an inquiry into the system of organized labour in some parts of the agricultural districts, known by the name of agricultural gangs, we have taken measures for beginning the inquiry as soon as the gangs recommence their labours in the autumn.

327. We were deprived of the valuable assistance of our colleague Mr. Richard Dugard Grainger, by his death; but not until the work of the Commission had approached so nearly to its termination as to make it unnecessary for us to ask that his place should be supplied.

sidcrable subject now to be reported on; except the agricultural gangs, to which this Commission has been recently extended.

All this we humbly certify to Your Majesty.

(Signed) HUGH SEYMOUR TREMENHEERE. (L.S.)
EDWARD CARLETON TUFNELL. (L.S.)

2, Victoria Street, Westminster,
July 1865.

APPENDIX TO FOURTH REPORT.

REPORTS AND EVIDENCE

OF

ASSISTANT COMMISSIONERS.

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REPORT upon the METAL MANUFACTURES of the SHEFFIELD District, by Mr. J. E. WHITE.

To Her Majesty's Commissioners.

A.

Steel the basis of the staple manufactures.

Gentlemen,

1. Steel remains, as it always has been, the material on which the chief manufactures of Sheffield mainly depend. Other materials are used, often more or less directly in connexion with, in some cases independently of the use of steel; but nearly all the important manufactures of the town, and those on which its reputation and prosperity rest, may properly be treated as falling under the head of "Metal Manufactures." Of the steel work, parts are of a kind which admit of being and are done in the country district for a few miles round, say, roughly, for five or six.

Iron and other manufactures.

2. Beyond this limit, and yet within the far wider area of surrounding country assigned by you for my inquiry, as forming the Sheffield district, other manufactures are carried on. The chief of these is that of iron, which is carried on to a large extent in and near the town of Rotherham, and in iron-works scattered over the country for many miles to the north of Sheffield, and ending in the south in the neighbourhood of Chesterfield. Barnsley and its neighbourhood formed about my limit on the north. No other large towns than those named are included in the district.

3. Of the population out of Sheffield, large numbers are employed in collieries, others in potteries and linen factories, classes of work already under regulation, and some in glass works, a subject reserved for separate treatment.

4. The above account of the manufactures of the district is only general, and will require some modification in detail. The large works in Sheffield deal with iron as well as steel; steel is in some cases worked at a greater distance from Sheffield than above pointed to; and there are some miscellaneous manufactures, *e.g.*, hair seating, paper making, and confectionery, as to which some evidence has been collected, but which need not be further noticed here.

Changes since 1841.

5. Many of the manufactures remain the same in kind, and carried on upon the same system as at the time of the inquiry here under the former Children's Employment Commission, and then described. Two circumstances, however, in particular, have contributed to bring about great and important changes since that time.

6. One is the very great increase in the use of steel for many purposes to which it was then but little applied. Formerly it was used chiefly for cutlery and cutting tools of all kinds and other smaller goods; now it is used also in heavier masses, and for many purposes for which iron was formerly employed, *e.g.*, ordnance, shot, railway wheels and rails. Large quantities are required for new trades, such as crinoline and steel-pen making, as well as for many other purposes which need not be enumerated.

A.

1. From the more general use of steel.

7. This increase in the use and importance of steel seems likely to be carried to a far greater extent. It is to it that the great growth of Sheffield of late years in population and prosperity is probably to be attributed, Sheffield being the great, almost the only seat of the steel manufacture in the United Kingdom, and supplying steel productions very largely to other parts of the world.

Great growth of Sheffield.

8. The population of the borough of Sheffield, which includes, however, a populous country district, has increased from 110,891 in 1841 to 135,310 in 1851, and to 185,172 in 1861.

Great size of steel works.

9. The older trades seem to have grown but little in proportion, some not at all; but steel works of great size have sprung up. The steel works of one firm, exclusive of two sets of premises in the town, cover an area of 24 acres at a short distance from the town. Another firm are now building in the same neighbourhood steel works which cover 20 acres of ground. Two other steel works, where iron is also manufactured, cover respectively 13 and 15 acres, and employ 2,000 or 3,000 persons each.

2. From the increased use of steam power.

10. Another circumstance which in Sheffield, as elsewhere, has brought about an important change, is the increased use of steam power. This has had the tendency of concentrating in factories, some of considerable size, a large amount of work formerly done without power, and consequently in the homes of the workers and small shops. This is particularly the case in the cutlery manufacture.

But benefits of factories imperfectly realized.

11. The effect of this change, though to some extent the same as that arising from the substitution of factories in other seats of manufacture, is less complete. The workers even in factories keep much of the old independence of their masters, in fact, are more in the position of small manufacturers themselves; and much of the work still remains independent of the use of power, even where the workers, as in the case of cutlers, use it for some portions of their work. Thus, many of the advantages which might be thought likely to result from the supervision of a master over workers and their hours, and the state of their work-place, &c. are, unfortunately, often very imperfectly realized.

Opposition to extension of machinery.

12. Steam power could and no doubt would be still further applied with advantage in other manufactures of the district, were it not for the resistance which, it is feared, might be offered by the workmen. In the file manufacture, for instance, machinery is now successfully used abroad at a great saving of cost, and it has also lately been introduced near Manchester, but it is entirely excluded from the Sheffield district, in which the file trade is one of great importance, and has its chief seat. Should the machinery ever come into general use in the trade, *i.e.* so far as it is applicable, the change in this district would be very great, as the present hand labour of a very large number of persons of both sexes and all ages, the greater part of whom work in small shops in Sheffield and the country villages, would be, to a great extent, superseded by the factory labour of a smaller number.

Arrangement of subjects in the Evidence.

13. Though the manufactures of the district are far less miscellaneous than those of the Birmingham district, it is not easy to make a satisfactory classification of them. Very different branches of work are often carried on by the same manufacturer on the same premises, and different processes in the manufacture of a single kind of article are done in entirely distinct places and on an entirely different system. The arrangement of evidence which I have attempted is as follows:—

Grinders.

14. The grinders' trade, as carried on in Sheffield and its neighbourhood, is placed first, as being one of the greatest importance in several ways,—not only on account of the numbers engaged in it, but more especially on account of its serious effect upon their physical condition, and the apparent ease with which remedial measures might be applied. A few passages relating to this subject will also be found in the later portions of the evidence, from which they were not easily separable. The articles on which grinders work are very various, *e.g.*, knives of every kind, forks, razors, scissors, saws, files, edge and other tools, and cutting implements of all kinds, as well as larger surfaces, such as grates, fenders, &c.

Steel and iron, heavy and light.

15. Different branches of the general steel and iron manufactures come next, including articles of the heaviest and lightest kinds, which often cannot be separated. They embrace a very wide range of productions, from armour plate, ordnance, and the heaviest castings down to the finest file, or wire of almost imperceptible diameter.

Cutlery.

Narrow meaning of the word.

16. Cutlery, the manufacture for which Sheffield has been so long celebrated and is still probably best known, is of course an important trade. It is almost entirely confined to Sheffield. The word is used in Sheffield in a sense narrower than its popular and original one, being taken there to mean only the handling, making up, and finishing of knives, razors, scissors, &c., not the forging or grinding of the blades.

Bone, &c.

17. Cutlery and trades connected with or subsidiary to it deal largely with other materials than metal, *e.g.*, bone, ivory, horn, and wood.

Electro-plate, &c.

18. The electro-plate and white metal trade is one of the staple manufactures of Sheffield.

Sundry trades.

19. Brass founding and a few miscellaneous manufactures unconnected with the staple manufactures of the place are the remaining subjects.

Places, where.

20. Where a separate town or village is not put in the heading, the works named are in or close to the town of Sheffield.

1.—Ages at which Children and Young Persons are employed.

Few very young.

21. Taking the manufactures of the district generally, the proportion of children to adults employed in them is small. It is in few that they are employed to any great extent under the age of 9 or 10, but from this age upwards they are employed wherever light work, and in some cases work that is not light, can be found for them.

But some even at grinding:

22. It is common for children to enter upon one of the deadliest occupations known, viz., fork grinding as young as 9; most begin it at or before the age of 10; some as young as 8, or even 7. I found a

child of 6 years old in a wheel where he has worked for some months at other dry grinding for his father. In grinding of most kinds the usual age of beginning is from 9 to 13; a few begin rather later.

and in iron works.

23. Even such establishments, however, as the large iron and steel works, the former involving systematic night work, give a few instances of boys of very tender age. In some large country iron works I found two boys who came there one at 7 years old, the other at 8; in some very large iron and steel works in Sheffield a boy who came at 8 years old; and in some small steel works in the country a boy of 7, who occasionally does odd work there. The common age, however, for beginning in such works is from 10 to 12.

The youngest at cutlery.

24. But the employment in which most of the youngest children are found is cutlery. Girls as well as boys sometimes begin this at 7 and even 6 years old; and one boy whom I found at work had begun at 5. A woman who began cutlery herself at 6 years old, and put her "own lass, now dead, on at "three weeks turned 6," says "they lifted me up on a stool to reach my work, as I was not big enough "to get up myself." (No. 188.)

Fault of parents.

25. In most cases the youngest children are employed by their own parents or relations; often in consequence of the intemperate or improvident habits of their parents.

II.—Sex. Number of Girls and Women.

Females in factories, few;

26. Females are not employed at all in iron or steel works, strictly so called, or in grinding wheels. A few, however, are found in factories in which small steel goods, such as files, saws, and other tools are made; and a moderate number are employed in the warehouses of cutlery and other factories in finishing and wrapping up small articles. The warehouse employment, in many cases, involves actual manual work, essential to the completion of the article for sale, apart from mere packing.

excepting certain trades.

27. Still there are few occupations in which females are employed to any large extent, but in some of these few the proportion of females is large. As regards occupations carried on in factories, these are chiefly the manufacture of plate of different kinds, crinoline, and hair seating; which latter, however, is now almost entirely confined to one large manufactory.

Outshop and home work.

28. They likewise work at cutlery and file cutting in their homes or in small outshops, and at cutlery in small factories.

Numbers in some trades.

29. I have not the means of estimating the numbers of females employed in the different trades, but give a few instances. Their number in the file trade is put at from 500 to 600 from 9 years old and upwards; in cutlery at a few hundreds of like ages; and the number in warehouses of metal manufactories also amounts, probably, to some hundreds. One electro-plate manufactory employs about 300 females, most of them adults. The hair-seating manufactory employs nearly 300 women and girls from 9 years old upwards.

III.—Number of Children and Young Persons employed.

Proportion small.

30. The proportion of children to adults in works of any kind is small, and in the heavier kinds of work, as steel and iron works, the proportion of young persons is small also. But as far as I can judge, in these respects the census returns, which do not follow the many technical divisions of the trades, afford but a very imperfect guide; but so far as they go, it may, in my opinion, be safely taken that they fall below rather than above the numbers of the young actually at work in the staple manufactures of the district. As the conditions under which the manufactures of the district are carried on make it difficult to form any estimate by means of direct returns, I think it wiser to abstain from attempting to form any definite estimate as to manufactures generally. As to some trades, however, I am able to give specimens.

Numbers in certain trades.

31. Thus the boys, *i.e.*, all under the age of 21 down to about 9 or younger, engaged in grinding were estimated in 1857 at about 1,850. The numbers in each branch of grinding are given in No. 2. About 500 children and young persons are employed at table knife hafting, and a larger though not very definitely given number (see No. 203) at spring knife cutlery, and several hundreds in file cutting. A large number of boys, which, however, I have no means of ascertaining, are engaged in rolling mills, both of steel and iron, and both in Sheffield and in country works.

IV.—Hiring of Children and Young Persons.

Generally employed by workmen.

32. It remains, as it was formerly, the general custom for children and young persons to be employed not directly by the manufacturers, but as apprentices, or as servants to men who work by the piece or contract to supply the manufacturer with a given amount of work at a given rate. Where the men, however, are paid by the day, which is the case in some branches of work, boys are found in the direct service of the manufacturer.

Apprenticeship.

33. The custom of apprenticing is stated to have much declined, partly in consequence of the growing wish of the young for independence, and partly of the efforts of the trade societies to limit the number of apprentices allowed in each trade. Large numbers of boys, however, are still engaged as apprentices, and formally bound, and are boarded, fed, clothed, and paid by their master. The trade rules often prevent a working man from taking more than one apprentice, but small masters, who are not bound by such rules, will often take more. When trade is bad, and the master falls into difficulties, the boy naturally suffers, and it is chiefly on this ground that complaints are made by apprentices before the magistrates.

Long periods of ditto.

34. Whatever be the age at which a boy is bound, even if he is only 9 or 10, he is bound till he is 21. It thus happens that in spring knife cutlery "plenty are bound from 10 years old till 21." Such a practice seems plainly undesirable.

Under-employment unfavourable to the young.

35. The practice of under-employment, though convenient to principals, tends here as elsewhere greatly to the prejudice of the young. If the principals paid the wages of each worker directly, they must know somewhere about the number of hours worked by each, and it is hard to believe that they

would allow young boys to be kept at work for the excessive number of hours which they not unfrequently are. Nor would they probably engage boys so much below the ages which they consider right and suitable to the work as many boys on their premises are.

V.—State of the Place of Work.

A.
The grinding wheels.
Public.
Private.

36. The places which from the nature of the work need the most care and attention to sanitary arrangements, and on which nevertheless the least care seems bestowed, are the "wheels" or buildings in which grinders work. These are sometimes separate factories or premises devoted exclusively to grinding, and sometimes form part of a manufactory in which other processes of manufacture are carried on. The former kind are usually what are called "public" wheels, owned by persons who take no concern in them beyond receiving the rent and supplying the power. In these, the grinders are quite independent of any control except that, for obvious reasons, power is scarcely ever supplied beyond the stated number of hours. The grinders rent their work-place and power, and find their own tools and implements. They also often work in what are called private wheels, *i.e.*, those within the works of a manufacturer, on much the same system, whole hulls or separate troughs, as the case may be, being let off to grinders. In some cases apparently men pay rent though doing the work of the manufacturer on his premises.

Construction unaltered since 1841.

37. The construction and internal arrangement of the wheels, with their division into workrooms or "hulls," and of these into "troughs" or the separate spaces occupied by a grinder and his assistant, and the manner of work, remain the same as described by Mr. Symons in 1841.

Number greatly increased.

38. Since that date, however, the number of wheels in Sheffield has greatly increased. It was then 50; in 1857, it was, according to an account then taken by Dr. Hall, 80; and, as I am informed, it is now considerably larger. They are worked by steam power.

Water power wheels diminished.

39. On the other hand, owing to the more general use of steam power, the wheels in the country near Sheffield, which were all turned by water power, have greatly diminished within the same period. In 1841 they were estimated at 40, and in 1857 at only 16. The latter, however, appears to me to have been much too low an estimate, as I have been in seven in one valley alone. Those in another valley, that of the Loxley, were all swept away by the flood of this year, 1864. There are still several others elsewhere.

Bad consequences of steam power.

40. The effect of the change from water to steam power has been to bring the grinders into more confined places, and in which the injurious effect of the work is much intensified by the greater amount of dust produced in a given space, and by the work becoming constant, instead of intermittent as is necessarily the case where only water power is used. The evil is increased by the loss of the exercise in the country air formerly enjoyed. Till steam power was introduced in the trade, towards the end of the last century, the grinder's disease was scarcely known.

Great want of ventilation;

41. Grinding, above most works, owing to the noxious nature of the dust produced, requires that there should be ample ventilation. I have rarely seen work-places in which it is less attended to, or in which, in the town at least, it seems so difficult to provide for it. The nature of the work and of the machinery required secures in all cases a fair amount of cubic space. But here all that can be said in their favour ends. They have windows only on one side; and in the town, where space is valuable, the work-rooms are built back to back, and floor above floor, the lower rooms being often vaulted to support the weight of machinery above.

of light, and comfort;

42. The rooms or hulls are thus ill-lighted and gloomy; some which I have seen are quite unfit for use. In some the plaster is falling from the ceiling, in others wet is dripping from the floor above, and is sometimes caught by sheets of metal placed to protect the workers beneath. The glass is generally broken out from the windows, and purposely by the grinders to allow the dust to escape and to admit light, which the glass, covered by the dirty spray from the grinding, keeps out. This subjects the workers to draughts, and in winter to severe cold, ice sometimes forming on the stone if left for a short time. The dust also is thus blown back upon them. Some suggest that if the light and air were admitted from above it would be a great benefit, but in the town wheels, where several stories are used for grinding, it would be difficult to secure this.

of fans.

43. The great benefit of fans in protecting the workers from dust in dry grinding of every kind, indeed the absolute necessity of them for the preservation of health, is universally admitted. In many places fans are put up and used, but numbers of dry grinders, particularly fork grinders, who need them most, are without them, and some neglect to use them even where they are put up, thus injuring others, who work in the same hull, as well as themselves. I have not been able to ascertain the proportion of workers who do not use them at grinding dry, but from the evidence and from what I have myself seen, it is considerable. The expense alone cannot, or at any rate should not, be the cause of the neglect. A fan may be put up so as to protect several workers at the cost of a few pounds, *e.g.*, from 5*l.* to 10*l.*, or for much less, *e.g.*, from 30*s.* to 3*l.*, for only one. Where there are fans they are sometimes used by glazers and polishers as well as grinders. In the Hathersage needle and hackle pin manufactories precautions apparently as complete as is possible for protecting the grinders are used.

Wet and dirt.

44. The floors are often sloppy with wet, from which, as well as the draught and cold, the workers suffer. This is not necessary, and can easily be avoided by a proper construction of floors with drains, as is done in some cases. The amount of dirt thrown off from the stones in the shape of mud is very great. Any one who has not seen wheels would be surprised at the loathsome look of some places from this cause, and from the way in which the mud is shot down and allowed to accumulate in full sight outside. There appears no reason why cleanliness of appearance should not be more attended to, though that it is not is easily accounted for by the fact that, owing to the system above described, it is considered no one's business to see to it.

Cutlery and other workshops.

45. Some of the other workshops, especially those used for cutlery, are cramped and ill-arranged, and equally neglected with the wheels, but the dirt where dry is less objectionable to the eye, though probably not to health. The glazing of bone and other handles, &c. causes a great amount of dust. "The master does not have the shop cleaned. We are too tired (*i.e.* to do it ourselves). That heap of "bonedust in the corner (a bushel or two) has been gathering for many a week. It is three weeks

"since we swept the rest of the shop. The dust is swept into the corner." No. 188. By all appearances, cleaning, whitewashing, &c., are in general very much neglected, just as in the instance here quoted as a specimen.

Cellars and cellar boys.

46. Some of the work-places, however, which strike me as most objectionable, especially considering that the persons employed in them are usually young boys, are what are very properly called the "cellars" beneath the steel melting furnaces. These are vaulted passages beneath the furnaces and the level of the ground, reached from the outside by descending stairs, from which, and perhaps a grating at one side, the only daylight is admitted. Overhead along one side is the row of steel melting pots with fire beneath, causing considerable heat. Still this at any rate makes the cellars dry and warm enough, and though some of the work is heavy, the boys have much spare time. In one case, and that in works of about the highest standing in the trade, I found a young boy who works part of his time in one of these vaults and the remainder in a dark cellar beyond, lighted only by a dim oil lamp, and with no communication whatever with light or air except through the vault. His health had suffered considerably. Only one or two boys work in the cellar of each furnace. There are one or more furnaces, according to the scale of the works, in a few works a considerable number, but the number of "cellar boys" cannot in any case be great.

VI.—Nature of Employment.

All grinding noxious.

47. The employment of grinders is without question one which demands most serious notice. The evil public notoriety which "Sheffield grinding" has obtained is but too well founded. The process is so simple and so well known that it need not be described. Whatever be the branch of manufacture in which it is required, there is little difference which strikes the eye, except the greater or less size of the stones or of the glazing or other implements used, with differences as to the substance, dryness, &c. of their surface, and the greater or less degree of stooping over different kinds of work, with the fact that in some cases, as in saw grinding and glazing, the worker stands.

Unhealthy posture.

48. In most of the work he sits astride on a broad flat-topped horsing, too broad for young boys. One of the average kind which I measured was 14 inches wide. The body is sometimes thrown forward almost horizontally, but more often curved forward with the head down, and most so where the stone or wheel used is small, the work to which the youngest boys are first set.

"Grinding" includes other processes.

49. It is, however, I think, well to point out here that the term grinding, as used by the workers themselves, refers only to the process of shaping and smoothing metal by cutting it on a revolving stone. But in most kinds of work there are one or more subsequent smoothing processes, such as glazing on a wheel covered with emery, lapping on a wheel covered with lead, and polishing on a wheel with crocus powder, which form essential parts of the grinder's work, and are performed by him or his helpers in the same work-place, and usually in the very same trough. For practical purposes the kinds of work could not conveniently be distinguished. Their essential characteristics are the same, and the same person may be engaged in one or other process indifferently at different times of the day.

Great amount of dust.

50. But each kind of work varies in the amount and kind of the particles thrown off. The amount is greatest and most injurious in fork grinding and needle pointing. A needle and hackle pin manufacturer states that a 20 lb. packet of steel wire loses from 4 lbs. to 5lbs. in the grinding, and that his 23 stones thus throw off in a day about 75 lbs. of steel dust, and a far larger amount of stone dust. Another puts the loss of weight in grinding at 5 lbs. in 20 lbs. in average work, in some more. Thus at least 3 lbs. of fine steel dust, besides the larger amonnt of stone dust, is produced beneath the face of each grinder daily. This is all dry dust.

51. In the needle manufactories, however, most of this dust is carried away by a fan through pipes into the outer air. I smelt the dust from one such manufactory before I was within 70 or 80 yards of it, and though in an open field, and I could see the dust floating away like a cloud. It not only covers the roofs and windows on which it settles with a brown rusty coat, till in time the glass becomes obscured almost as if it were painted, but so corrodes them as to make the slates and even the glass crumble away. The dust collects in the flues, which carry it from the stone, in large black stalactite-like lumps. Two such were given to me weighing over 2 lbs. each.

52. Forks of an average kind lose about a fourth of their weight, all in dry dust. A dozen razors of two common kinds are respectively reduced by dry grinding from 2 lbs. to 1 lb. 10 oz., and from 2 lbs. 4 oz. to 1 lb. 15 oz. Razors lose a further amount on the wet stone. The dust of metal, *i.e.*, cast iron, used for cheap forks and scissors, is usually considered more "pernicious" than that of steel.

Dry and wet grinding.

53. The opinion of many persons that the universally admitted unhealthiness of grinding is properly to be attributed to only one branch of it, viz., "dry" grinding, *i.e.*, grinding on a dry stone, appears contrary to the facts. It is, however, only a very small portion of grinders who do not use the wet stone at all, *e.g.*, fork grinders and a few others. It is very few again who use only the wet stone, *e.g.*, file grinders. Most use both the wet and the dry stone and the glazing or polishing wheels, but in proportions varying with each kind of work.

"Racing," &c.

54. In all kinds of grinding it is necessary to "hew" and "race" the stones, processes which cause a great amount of dust, the latter especially, and to such an extent as to affect all the other workers in the place.

Fans not used in wet grinding.

55. Fans are never used for grinding on a wet stone. It is said by many that there is no need for them, and by all whom I have asked, that owing to certain mechanical difficulties of arrangement they could not be used. Intelligent workers, however, say that, if any such plan for carrying off the spray and dust which are caused even by a wet stone could be adopted, it would be a great benefit to the health. It seems plain that it would, for streams of sparks fly off from the wet stone as from the dry, and particles, I am informed, may, in a bright light, be seen rising upwards towards the wet grinder's face. This I never had a chance of seeing, the work-places being mostly so ill-lighted, and the smoke-loaded atmosphere in late autumn so murky and thick.

Might be used for all work.

56. There would be little or no difficulty whatever, so far as I can learn, in using the fan for all processes where the dust caused is dry, as in glazing and polishing. It is the opinion of thoughtful

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causing dry dust.

people, employers and workers, that it should be so used, and this not only by grinders, but by cutlers, and workers in bone and other materials, whose work, or parts of it, causes a considerable amount of dust.

Steel converting, melting, &c.

57. Steel converting, *i.e.*, the manufacture of the raw material from iron, is work done only by men. In steel melting boys are employed in the cellars already described beneath the furnaces to watch the bottom of the furnace, and give notice if any of the pots run. This is likely to happen only at certain periods of the day, *i.e.*, towards the end of each of the usual three rounds of melting. But the boys are occupied in the cellars in treading clay and making of it lids and stands for pots, the pots themselves being made by men. Boys go up into the furnace when the steel is teemed or poured out into moulds to carry away waste, and in some cases help the men in teeming. Otherwise all employed in steel melting are men.

Metal rolling.

58. The work at rollers, in which a great number of boys are engaged, is in my opinion often very heavy for their age and strength. Boys plainly have sometimes to strain their bodies considerably to enable them to heave up the weight of metal so as to pass it back over the roller, and I have seen a boy failing in his efforts and dropping the red-hot iron or steel close by his legs.

Often beyond boy's strength.

59. Young boys may struggle passably through heavy work to which they are properly unequal, but, to judge from my own observation, there are many cases in which greater age and strength, even if they cost more in wages, would go far to repay this to the employer in increased speed and efficiency of work, taking no account of the benefit to the boys in saving them from undue exhaustion, and so also from risk of accident likely to result from this.

Force spent in file cutting.

60. Even in file cutting, which looks quiet though rapid work, the amount of bodily force spent in the course of a day is considerable. The data given by one man, assuming them to be correct, show that in a day of ten good working hours he makes 46,000 strokes, most of them with a 7½ lb. hammer, thus lifting a weight of 142 tons. (No. 130; cf. also No. 128.) Boys use lighter hammers, "usually "from ¼ lb. up to 3 lbs.," but with lighter hammers work is quicker, and at light work girls, it is stated, can work quicker and earn more than boys.

Heavy hammers used in forging.

61. Boys sometimes use too heavy hammers in forging. A witness speaks of having "seen a boy "14 years old using a 22 lb. hammer, and some who have grown completely out of form from the "work." (No. 128.)

Other work, as in 1841.

62. The description of other kinds of employment of the district furnished on the occasion of the former inquiry here may be taken as equally applicable to them as still carried on.

VII.—Hours of Work.

Piece work.

63. Owing to the general prevalence of the system of piece work and the independence of the workers no accurate account of the usual work hours can be given. All that is possible is to give instances of the hours which, as a fact, are most commonly found in some of the chief trades.

Hours in wheels.

64. As regards grinders in Sheffield, who depend upon steam power, it appears that their proper hours, which are moderate, being 60 hours a week, or a little over or under, though not equally distributed to each day, cannot often be exceeded, for the simple reason that power is seldom supplied for more than the stated time. It would be a loss to the owner of the wheel to supply it for longer to be used probably only by some of the workers. A boy of 10 years old, however, was glazing forks al through the week in which I saw him from 6 a.m. till 9 p.m., having no breakfast or teatime. (No. 16.)

In water wheels, irregular.

65. Where the power used, as generally in country wheels, is only water power, the hours depend upon the supply of water, and often, especially in summer, are much below the supposed amount, which does not exceed that of the town grinders. But, on the other hand, time is apt to be made up, and long hours are made by some. One boy, a fork-grinder, works "many times 15 hours a day."

Factories open for long hours.

66. The same rule of not exceeding a moderate stated number of hours appears to hold good in many trades, so far as regards the use of steam power; but where work can be done independently of power, no objection is shown to longer hours of work. Thus many factories are kept open for 14 or 15 hours for those who like to work, though, as a fact, it is only by a few, or towards the end of the week, that more than a moderate day is made. But where the workers are irregular in their habits, or the earnings, as in the case of cutlers, are comparatively low, the effect is that in some cases, or in the later part of the week, unduly long hours of actual work are not uncommon. Thus, at times, factories are open for 15 or in some cases 16 hours in a day.

67. In some cases, as in file cutting, men can work late without keeping the boys, but in other work, as iron and brass founding, cutlery, metal rolling, &c., children and young people are kept late to help the adults.

Small shops.

68. A fair sample, probably, of children's work in small places is given by a boy, No. 196:—

> "Worked at cutlery before at a small place. There was only one boy besides me. I war but a little 'un when I went; must have been about 8 years old. There were no regular hours. Sometimes went at 6 in the morning and worked till 9 at night, and on Fridays sometimes till 9½ to finish for Saturday, but that was the latest. * * * Did not work much at the beginning of the week; may happen half a day on Monday, according to the work. Had about 20 minutes for dinner, and took it there, and about a quarter of an hour to us teas, and breakfast about the same, or while we could swallow it."

Week before Christmas.

69. In Sheffield, in the week before Christmas, called "Bull week," it seems generally understood in works of most kinds that the workers may work very long hours, in some cases as long as they please, to earn money and make up the time which will be lost in the holiday following. This custom is much deprecated by several thoughtful persons. No doubt, as an intelligent cutler states, "it would be a "great blessing to Sheffield if Bull week could be done away with; I see nothing in it but folly." (No. 203.

Steel and iron works.

70. In steel and iron works a period of 12 hours work, less stoppages, is the established rule, and where night work by relays is carried on the stated time cannot well be exceeded, except in a very objectionable way noticed separately below. Where regular night work is not practised, overtime for a quarter or half a day is sometimes made.

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Steel melting.

71. In steel melting much overtime is pretty well guarded against by the nature of the work. The pots used for melting, which are renewed every day, become so worn out by the great heat, that they cannot be used for more than the usual three rounds without a risk of loss from the waste of metal which would overbalance the gain; though in some cases an extra round is made. The three rounds are usually completed in 12 hours or less. As a rule no fresh set of pots is put in for a night relay, but this can be done, if needed, and in rare cases has been done.

Saturdays unduly early a.m.

72. For the sake, however, of finishing work early on Saturday, and in some cases on Monday, the workers at some places have to begin on one or both of those days at a very early hour; viz., 4, 3, or 2 a.m. A boy of 9 years old, having to begin at 3 or 2 a.m., and living 4 or 5 miles off, had to sleep the night before on the floor of the furnace. (No. 115.) One states that he sometimes comes at 12 on Friday night. (No. 87.) That these early hours are not necessary is best shown by the fact that at several places they are not the custom; and at works of high standing, those of the Messrs. Ibbotson (No. 127), a change from 2 a.m. to 4 a.m. as the hour of beginning on Saturday has been found "a great improvement in every way."

An indirect evil of night relays to boys.

73. The practice of boys working at all by day and night turns, either in the usual course of things or at pressing times, seems inevitably to open the door to their not unfrequently working unduly long hours. These hours are indeed, in some cases, not only cruelly but even incredibly long for children. Amongst a number of boys it will of course not unfrequently happen that one or more are from some cause absent. When this happens their place is made up by one or more boys who work in the other turn. That this is a well-understood system is plain, not only from the statements of boys themselves, nearly all of whom, if questioned on the point, state that they have done so; but, perhaps still more clearly, from the answer of the manager of some large rolling mills, who, when I asked him how the place of boys absent from their turn was made up, answered, "I dare say, sir, you know that as well "as I do;" and admitted the fact.

Excessive overwork of boys.

74. But not only in this way, but also in places in which night work is not part of the system, an excessive amount of overtime is not unfrequently thrown upon young boys, *e.g.*, a quarter of a day, a half, or even a whole period of 12 hours in the 24. This is especially the case in steel and iron rolling of the lighter kinds, *e.g.*, for crinoline and wire.

Instances.

75. A boy 9 years old, or at most 10, worked at crinoline steel rolling three nights running, as well as the days, and this under his own father:—"We should have gone so (*i.e.* nights as well as days) to the "end of the week, only the engine broke down." (No. 79.) His case and the appeals which he repeatedly made to me whether he might not "go to school a bit longer, instead of working," struck me as peculiarly painful. Another, now 11, who went at 9 years old to hardening and tempering crinoline steel, worked there from 7 a.m. till 9½ p.m. four nights a week "for many and many a "month"—"many a time till 12 at night," and either once or twice "worked from 7 one morning all "through the next night and day, and on till 12 the following night." "I had to live very badly, and "if I had no dinner he (the man) always gave me a bit." (No. 149.) Another boy, at a rolling mill, where his proper hours were from 6 a.m. till 5½ p.m., worked about four nights every week till 8½ p.m. at least, and this for six months out of the nine that he was there, there being day and night relays in the remaining three months; and for about four months he worked one day and night together every week, and sometimes two days and two nights running. (No. 101.) Another at 9 years old sometimes made three twelve-hour shifts running, and when 10 has made two days and two nights running. (No. 143.) Another, now 13, at a former place worked all night some Fridays, and other nights except Mondays always till 8 or 9 p.m. (No. 85.) Another, now 10, at a former place worked from 6 a.m. till 12 p.m. three nights and till 9 p.m. the other nights in his only week there. (No. 220.) Another, now 14, has worked sometimes from 6 a.m. on Friday till 2 p.m. on Saturday. (No. 110.) Another, now 13, at a former place worked from 6 p.m. till 12 noon next day for a week together, and sometimes for three shifts together, *e.g.*, from Monday morning till Tuesday night. (No. 111.) Another, now 12, has worked in an iron foundry at Stavely, "from 6 a.m. till 12 p.m. for a fortnight on end; could not do it any more." (No. 169), &c.

Dangerous effects.

76. No wonder that boys sometimes fall asleep at their work, stumble, fall when the metal flooring gets "hot and slippy" and work is pressing, get burned or pierced with red-hot iron or steel, or otherwise suffer for their supposed negligence. After every allowance has been made for some inaccuracies of the boys' memory, which I am aware is necessary, especially where the facts spoken of happened two or three years back, and admitting that it is too much to suppose that the hours spoken of, which are necessarily put in the form of general statements, can possibly be given, in all the cases mentioned, with minute mathematical accuracy, though every care was taken to make them as accurate as possible, it is impossible not to believe that they are substantially true on the whole, and that they show the existence of an amount of overwork of young boys which is truly fearful.

VIII.—NIGHT WORK.

Females.

77. As regards females, there is no manufacture in which night work prevails as part of the system, though instances are mentioned in which they have worked very late, or through the night, in addition to their day work, as in cutlery and file cutting shops, and at crinoline steel.

System of relays.

78. In some branches of iron and steel work which employ boys, night work by relays is part of the regular system, but in steel works, in several cases, where the work is of precisely the same kind, night work is practised only when trade is good, and the demand sufficient to keep the works going for the 24 hours; thus showing conclusively that in several branches at least the night work of boys which prevails, is not essential.

From 6 to 6 or 12 to 12.

79. In some cases the relays come on at 12 o'clock noon and midnight, instead of the usual hour of 6. The only reason which has been given to me is that the hands like it better, as it leaves them always some part of the day off work.

Some boys always in night shifts.

80. It may happen that a boy is kept always on the night-shift, instead of working in the day-shift in alternate weeks as others do.

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Effect of Monday night work.

81. The night work presses hardest on the boys on Monday. Having been to bed on Sunday night they "cannot lie in bed on Monday, so I am up for 24 hours running. It is very seldom as ever I do go to bed on Monday then." (No. 167.) It also seems but natural, as a steel manufacturer who employs boys in night work states, that boys who work at night at all "cannot sleep and get proper "rest by day, but will be running about." (No. 109.) On the other hand the night relays get the advantage of working only five shifts a week.

Water power hours.

82. In some steel works where only water power is used it is stated that work goes on at any hour of the day or night just as the supply of water makes it convenient. Water power, which is plentiful in the neighbourhood of Sheffield, is still found valuable at any rate as an auxiliary.

IX.—Meal Hours.

In grinding wheels.

In water power wheels.

83. In grinding wheels worked by steam power the engine stops at dinner time for an hour, but at no other time, and does not stop for dinner on Saturday. In wheels worked by water power, as those in the country, where artificial light is less easily obtainable, no stoppage of the machinery takes place, a meal merely being taken and work recommenced.

In other works.

84. In other kinds of work, except iron works, half an hour for breakfast and an hour for dinner are usually supposed to be, and where the work is day work are, taken; but where the work is piece or independent work, the meals depend much upon the choice of the workers, or rather of the men. Boys have little choice. Their meals are often much curtailed. (Nos. 212, 203, 196, &c.)

In iron works.

85. In iron works fixed times for meals are not customary, and are said to be impossible, but the workers take their meals in necessary intervals in their work, which are stated by employers to be frequent and ample for the purpose. The length of these times will vary much, but clearly is not always ample. An iron-works boy, though in a foundry, states—"Have time for meals just while we "eat them, but no more. (No. 169.) Another puts the case much the same:—"Have no time hardly "for meals, but get them between times." (No. 94.)

X.—Holidays.

Several.

86. These appear ample in Sheffield in most trades, but vary somewhat in different kinds and places of work as well as with the state of trade. They remain much the same as stated in 1841, except that a short day on Saturday, ending at from noon to 3 or 4 p.m., has become pretty general. To make up for this, however, in steel melting, work is sometimes begun very early on that day, as at from 5 to 2 a.m. Monday is in most cases shorter than other days, and by many workers either in whole or in part wasted. When this is the case, longer work is here, as elsewhere, thrown on Friday, especially in small work-places.

XI.—Treatment.

Occasional ill-usage.

87. Boys are sometimes, but I believe not often, ill-treated by men. One, whom his master used to swear at and punch, *i.e.*, kick, *e.g.*, "when he (the man) came back from the public," says, "They can't "beat you unless you're bun (bound), but then they can." (No. 85.) Several persons have spoken to me of the greater security of boys from ill-treatment now in consequence of so much fewer being tied to a man by apprenticeship. Another boy speaks of different men who ill-used him, particularly "a "Brummagem chap, who was always scabby, *i.e.*, agate of hitting on us;" "He used to get beer and "was drunk." "One time when he was striking at me with his fist I tried to get out of the way, and "my shirt nearly catched the shafting. If it had I should have been took round and killed." (No. 143.)

XII.—Accidents.

Unfenced machinery.

88. Serious accidents happen, but are not common. Comparatively few females are exposed to them. But I have seen work-places where they are in danger, which might easily be avoided by proper covering of shafts and bands, and in one factory was told that some boarding, which I had noticed, was put up over some shafting on the recommendation of the coroner in consequence of a fatal accident to a female. Where females work such precautions are sometimes used, sometimes not. In one cutlery shop a young female, polishing wooden knife handles, had her dress stripped off by the shaft twice in the same day. (No. 201.) In another, the mistress told me that one of her girls "was a dragon "for getting into danger and needed watching, and had even sat down on the shafting, just to see how it "felt when it was 'set agate.'" "Girls are soft giddy things." (No. 188.)

89. Uncovered machinery is a source of danger, not only to those at work, but to girls and children who may constantly be seen coming in for other purposes, such as bringing their relations' meals, errands, talking, &c. In this way a boy was drawn through rollers and killed (No. 179); a boy of 9 years old, in playing, fell under the shafting in his cutlery shop and broke his leg, and was laid up 14 weeks with it. (No. 190.) In some cutlery and grinding works a girl, in playing, was crushed by a drum. "They had to pick up her bones in a basket as they found them, and that's how they buried "her." (No. 188.)

90. Bands, the straps which convey the power to the workers, furnish the chief source of danger to boys, especially the throwing them on and off. This, I am convinced, might be much diminished by a better arrangement and protection of the bands, and mechanical contrivances such as I have seen in use. In a bobbin factory in which a great number of boys work at lathes, &c., requiring bands, these are brought up from below in such a way as to be out of reach in all but the part fitted to the lathe, and the boys are never "trusted" to throw their band on or off themselves, but must call a man.

Machinery in wheels.

91. In grinding wheels the machinery is often very much exposed. In some of them machinery of the same kind is covered over, sometimes efficiently, sometimes not so, but enough to show that such protection is both possible and thought desirable. In country wheels worked by water power I have seen most formidable cog-wheels without any protection. Grinders say that the danger is much increased by the want of light in the hulls, especially after dark, when some are lighted only by a few dip candles, and these shut in on three sides in rude wooden boxes to keep off the great draught.

Bursting of grindstones.

92. A source of danger peculiar to grinders arises from the flying of stones. An accident from this cause is likely to be most serious, though wonderful escapes happen. A stone flies either from some flaw in itself, or from the faulty way of fixing it on its axle, or from the too great speed of the machinery. Careful inspection and testing before use will do much to guard against risk from flaws in the stone; though it cannot in all cases ensure safety, as the flaw may be far inside and beyond the reach of testing. Fixing the stones on their axle by means of iron plates, which give strength to the centre of the stone, instead of on the old plan, which is still often practised, of using wooden wedges, which are liable to swell from moisture or from the heating of the iron, is admitted to be a great security, and there is no reason why it should not be universally adopted, at least for large stones, in which the danger is greatest. One man has had 10 stones break, besides several narrow escapes from stones near. (No. 47.)

Precautions. Danger of speed.

93. In some country wheels the apparatus for regulating the amount of water power supplied to suit the varying demands upon it is most inartistic and under the charge of no responsible person. At a factory in Hathersage (No. 75), a simple and effective apparatus for the purpose is in use. Too great a speed, whether from steam or water power, causes immediate alarm in the grinders, if they notice it. A stone flying may kill not only the person sitting at it, but others in the line either behind or before, or sometimes on one side, or even outside the building. A boy usually works behind a man. I have been cautioned not to stand in front of a stone, and my conductor, who warned me, told me that he had nearly been killed from doing so.

"Mites" in grinders' eyes.

94. Grinders are also liable to frequent pain, and sometimes to serious injury or loss of eyesight, from the "mites" or sharp particles of hot steel which fly into their eyes in grinding. Some wear glasses, but I did not notice many so protected. The glasses are said to incommode them and impede the sight. A fellow worker takes out the mite with a lancet or a "sharp pin,"—a very unpleasant sight. Grinders are sometimes kept awake at night by the pain. (No. 23.)

Circular saws, &c.

95. Boys are sometimes put to work needing greater care than can reasonably be expected from their age; *e.g.*, one boy only 11, another only 12, were put to work at small steam circular saws; work at which, "unless they have something of this sort (a simple contrivance for safety), they slit their fingers." (No. 204.) At some dangerous looking spoon rolling machinery "little Johnny lost his finger." (No. 218.) The circular-saw boy just mentioned as only 11 was away, having just lost his arm from being drawn up to the ceiling by the band and turned round the shaft.

Crushing in rollers.

96. Boys occasionally get drawn in by rollers, and of course then mangled or crushed. At some iron works in the neighbourhood a boy, as I was told, went through the rollers and "came out as flat "as a pancake." But, at most, metal-rolling boys have no business to be on the "putting-in" side, on which alone there is this danger. The parts which can be covered are sometimes protected by screens, but often not, and sometimes only imperfectly, as by a loose board.

Burns, &c.

97. In rolling hot rods or wire it sometimes happens that the metal coming out pierces a boy, *e.g.*, if it turns aside, or a boy stumbles against anything, or slips from the metal flooring having become very slippery. The danger is much increased by weariness or sleepiness from working long or unseasonable hours. Boys even fall asleep at their work. "When it (the hot steel) comes through, it wakes me." (Nos. 110, 101, 143.)

98. In working amongst hot metals slight burns are of course very common, but even these are enough to keep a boy away from work for a considerable time; or, if not, the constant work and dirt are unfavourable to healing. A boy of 10 years old told me that an ugly raw burn, which I saw on his thumb joint, had been in just the same state for more than six months.

XIII.—WAGES.

Generally good.

99. It will be sufficient, under this head, to say that, speaking generally, the wages are very good. In steel, iron, and other large works few boys get less than 3*s.* a week, and some, though quite young, from that up to 5*s.*, while some others, older, though not over the age of 16, get from that to 10*s.* In some branches of work, however, such as cheap cutlery, and work in which there is much competition from small masters, the wages are much lower; as low as 1*s.* a week is mentioned. Some table-knife hafters state that the average earnings of even the men in that trade are not more than 16*s.*

XIV.—INFLUENCE OF EMPLOYMENT UPON PHYSICAL CONDITION.

Grinding most injurious.

100. The common belief in the unhealthiness of Sheffield grinding is but too well borne out by the experience of medical men and trustworthy statistics. Grinders themselves also are well aware of the fact, and when questioned by me as to the effect of their work on health, have often answered by referring at once to the low average of life in their branch of trade, while a youth answers that he has not had anything the matter with him "yet." It is important, however, to bear in mind the many varieties of work, and the different degrees in which these are likely to affect the health; though at the same time, owing to the mixed nature of the employment of most grinders, it is difficult to trace the bad effects to one portion to the entire exclusion of others. But it seems clear that grinding is more or less injurious in proportion as more or less of it is dry.

The "grinders' disease."

101. The physical effects of the employment of grinding are so well known, and so fully pointed out in the evidence, particularly in medical statements Nos. 2 and 4, that it is unnecessary for me to enlarge upon them. I may state, however, that my own observation of the appearance of the grinders fully bears out the opinions expressed by others. The disease from which grinders specially suffer is known to them by a special name as the "grinders' disease," or "grinders' asthma," or simply as consumption.

102. The very phrases commonly used by grinders are expressive, and point to familiar evils. Fork grinders "go off like dyke water, so quick," if they begin young. (No. 15.) File grinders "go "off like nothing." "They seem to rot off at 34 or 35, and some at 23 or 24, according to their constitution." (No. 25.) A scissor grinder at 18 thought "he should go off." (No. 26.) A file grinder

A. Waste of life.

gets up in the morning "coughing and barking." (No. 23.) A fork grinder, aged 26, reckoned that "in about two more years, at his own trade, he might begin to think of dropping off his perch." (No. 2.)

103. The influences to which fork grinders are exposed "have a tendency to rob them of 25 years of "their lives." "It is an undoubted fact that many of these men are cut off before the age of 30." "In dry grinding very often before the age of 20 evidence is afforded of the existence of grinders "disease." A boy of only 11 years old, who had been a grinder since the age of 8, "had a fearful "cough, and on examination I (Dr. Hall) found the upper portion of both lungs extensively diseased." (No. 2.) "At that period one fourth (of the adult fork grinders) died every four years." (No. 4.)

Boys should not begin young.

104. It seems perfectly clear that entering upon the employment at an early age, especially in the worst branches of work, makes a grinder much more likely to suffer from the work. Many consider that a boy should not be allowed to begin till the age of 12 or 14. Allowing for the objection which may occur to some, that this opinion may be in some degree influenced by the wish common in many trades to keep up wages by preventing too great a supply of labour, I believe that the conviction that the work is unsuitable for young boys is sincere. It is expressed by most respectable men, and these as a rule do not take their own or other people's children to work for them under the age of 12 or 13.

Age of breaking down.

105. In most cases, however, not much if any bad effect is felt till the grinder is quite or nearly grown up. But soon afterwards health often breaks down very rapidly, and the cases seem very few where men while still young do not feel some amount of injury to their health. This, however, depends very much on the steadiness of their habits and their use of means for preserving their health, particularly of the fan. It is clear beyond doubt that the benefit of the fan is very great.

Stunted growth.

106. The growth of many, in this and other trades, appears from some cause to be stunted, and their bodies weakly. (Nos. 38, 128, 131, 132.) The confined position in grinding, file-cutting, &c., no doubt contributes to this. In some cases, the body becomes mis-shapen. Saw grinders stand at their work and grind wet. They are usually spoken of as the healthiest class of grinders, and as a fine set of men. The work takes more strength, and boys usually begin it at a later age. Some of the cutlery workers too are stunted. These begin at a very early age. A boy of 15, who had been at cutlery five years, measured only 4 ft. 7 in. high, 26 inches round the chest, and 5 inches round the wrist. Many are as slight and small of their age. (Cf. measurements, &c. &c. in No. 77.)

Lead poisoning from file cutting.

107. File cutting is injurious, owing not only to the constant confined stooping position, which "makes the back and side ache," but also to the lead on which the file is cut, the dust of which is absorbed, and causes colic. Weakness and wasting of the thumb and wrist are also common with file cutters. The weakness of the thumb is attributed by some to the constant strain from holding the chisel. Bow-legs are also attributed to the posture in working. "A doctor near here used to say that they (file cutters) were more like rotten sheep than anything. After a man is 40 they begin to hiss at him, and he goes down hill." "His hand is not so steady, and he only gets common work." (No. 132.) Lead poisoning is one of the prevalent complaints of Sheffield. There are, however, also in the town lead works, and some glass cutting,—a work in which lead is used. But the number of persons employed in these works is extremely small as compared with the file cutters.

XV.—Moral Condition.

Improved.

108. A full account of the general moral condition of the young of the working classes in Sheffield was given by Mr. Symons in 1841, and I do not think it necessary to go into the question afresh. As that account, however, was unfavourable, it may be well to add that, according to the opinions of persons speaking of trades with which they are acquainted, in some cases the advance of education and social changes have caused a great improvement; in others that there has been little or no change, or, if any, for the better. But on the whole there seems good reason for hoping that there is a decided improvement. There is, however, much need for more. Drinking prevails to a large extent, owing, probably, in part, to the thirsty nature of some of the employments; and there are other circumstances showing in too many a very low state of moral practice and feeling. The ease with which high wages are earned, coupled with the power of working irregularly, are thought to lead to some of the bad habits referred to.

Education.

109. As regards the state of education, I made less full inquiry than I have done in some other cases, but sufficient to show it to be very defective. The proportion who have not ever attended day-schools, or done so to any apparent profit, is decidedly large considering the comparative smallness of the demand for young children's work; and there appears also to be great neglect of attendance at Sunday schools and places of religious worship.

Neglect of schools and religious worship.

110. In the country districts the clergy and schoolmasters complain that the employments of the place or neighbourhood interfere greatly with education, and cause children to leave schools at a too early age; and also that great moral injury results not only from this, but from the high wages earned at an early age, making children independent of the control of their homes.

Ignorance.

111. Numbers of boys, some of considerable age, are unable to read or do more than tell the letters, if that; and in most cases where I made inquiry on such points, I found ignorance of simple facts of religion or secular life as great as I have found elsewhere. Some table-knife hafters compute that probably a third of the adults in that trade cannot read or write. In a manufacturing country parish out of about 1,000 persons who signed a petition a few years ago for the Sunday closing of beer houses, about 700, including a schoolmistress, made their mark. (No. 288.)

112. Having, however, in a late Report on another district, drawn out from the evidence a list of instances showing the kind of ignorance found there, I will only state now that, though in the Sheffield district I went much less fully into the question of education than I did in the former, the evidence furnishes a number of instances of just the same kind, showing, in several of the generation of citizens now growing up, a like ignorance of the country in which they live, the ruler by whom it is governed, or the Founder of the religion which it acknowledges.

113. For some illustrations of the above remarks, see Nos. 207, 85, 96, 97, 149, 252, 6, 143, 194, 35, 33, 82, 101, 152, 184, 200, 224, 225, 230, 240, 268—271, &c.

Metal Manufactures.

Sheffield District.

Mr. J.E. White.

A.

XVI.—General Remarks.

Legislative interference. Views of manufacturers.

114. As regards the question of any legislative interference with the labour of the young, there is a wide difference of opinion in Sheffield according as it is taken from one class or another. The leading manufacturers generally express opinions much to the same effect as those reported by me with regard to many of the same class in Birmingham, viz., that there is no occasion for any legislation. They consider that regulations may be beneficial in "factories" (*i.e.*, for spinning and weaving, &c.), where females and children work in numbers and in hot rooms, but that there is nothing of this kind here. They say that the hours are moderate, earnings high, and the operatives altogether in a very favourable position as compared with most in other parts of the kingdom, and probably more independent, indeed, far too independent. They believe that children are not employed young enough to be physically, at any rate, injurious to them; that none of the work except grinding is unhealthy; and that neither children nor young people are worked over long hours.

115. The operatives in Sheffield have undoubtedly many advantages, *e.g.*, separate houses for separate families; two excellent provision markets, which are perfectly thronged on a Saturday evening with the working classes; and moderate prices for the necessaries of life; while the earnings in many trades are very good.

The facts as to boys, &c.

116. But whatever may be the condition of the men in many trades, or of the workers generally in some, it is plain that the condition of the young in several is far indeed from being so favourable as represented. It must be remembered that under the system of work which has been described most of the boys are removed from the direct supervision of manufacturers. The wheels and many of the work-places are also. The hours which young boys are often kept at work are probably as much without the knowledge or thought of the manufacturer as they would no doubt be contrary to his feelings and wishes. Indeed, as much is stated.

117. The youngest children, too, are often employed by the men against the wishes of their master. Many employers would willingly, even gladly, dispense with young children entirely, and think that to a certain age they should be at school. This is the view of the thoughtful of the working classes.

Views of working classes.

118. The trades, it will be seen, are anxious for some measures to secure education and protection for children, attention to sanitary arrangements, and the protection from accidents by machinery. On these grounds they wished to forward my inquiry by all the means in their power.

Necessity of some supervision of wheels.

119. As regards the state of the work-places, the system of work in many places, especially in wheels where a master's supervision is not required, is very unfavourable to improvement. If the owner of a wheel puts up fans, the men have in some cases to pay for it by extra rent. If the owner puts none, grinders often either cannot or will not pay for one themselves; and if a careful man provides himself with one, he suffers from others who do not. One grinder who had put up a fan for himself and others working with him, took it down again because the others refused to pay a penny or two a week for it. Finding it gone, they offered to pay if it was put back. But neither would give way. The man said, "I know that I shall live so many years the less, but if they will not pay me, they shall not "profit by it." Under present circumstances some external authority for securing a proper state of wheels seems absolutely necessary if the health and lives of grinders, especially those not able or old enough to take care of themselves, are to be preserved.

Benefits of factory legislation.

120. Striking testimony as to the great social and political benefits brought about by factory legislation in the manufacturing neighbourhood of Barnsley, is given by a gentlemen holding an official position in that town, and it will not probably be discredited as unduly biassed from the fact of its being given by a relation, though not a son, and one who also bears the name of a well known promoter of that legislation. (Mr. M. T. Sadleir—No. 263.)

121. I also beg your attention, so far as applies to the present subject, to the Memorial (No. 289) presented to the Committee of Council on Education in 1857, from a manufacturing neighbourhood which I visited, signed by manufacturers and others, and praying for an extension of factory legislation to that neighbourhood; and also to the comments on that Memorial in No. 288.

122. On the whole, excepting some difficulties which would no doubt be felt in the large iron and steel works from compulsory regulations as to night work and meals of all boys under 18, there are probably few places or employments in the kingdom in which some proper legislative regulations as to the employment of the young, state of work-places, &c., could be applied with less derangement of the interests of trade, or with greater benefit to the large numbers concerned, than in the staple manufacturing employments of the Sheffield district.

I have the honour to be,
Gentlemen,
Your obedient servant,

Lincoln's Inn, December 1864. J. Edward White.

Metal Manufactures.

Sheffield District.

Grinders.

Mr. J. E. White.

a.

EVIDENCE.

GRINDERS.

1. On my applying to Dr. Hall, physician to the Sheffield Public Hospital and Dispensary, who has carefully studied the subject of the grinders' disease, he referred me to a late publication of his on the subject, as embodying the results of his inquiries, which were made with great care by personal inspection and with the help of intelligent grinders, so that in speaking of his statistics he is able to say, "they " may, I am certain, therefore, be taken as a close approximation of the truth." Some alteration may have taken place since that time as to details of the number of the wheels and of the grinders in some branches of the trade. The number of grinders in some trades, I have been informed, is probably not so large as represented by Dr. Hall, in one or two larger; but on the whole less. The main facts, however, and the character of the employment, remain unaltered. As the most convenient form of availing myself of his experience and views, I give some extracts from his book, and place them at the head of the evidence on grinding, as they give many of the general features of the trade, and will make parts of the evidence more readily appreciated.

2. Extracts from a Treatise on the "Sheffield Grinders' Disease," by J. C. Hall, M.D. (Longman and Co., 1857.)

The trade of a grinder is carried on in a building called a *wheel.* In and near Sheffield there are about 96* wheels, and of these 80 are steam wheels, and the remaining 16 water wheels. * * * The rooms in which the men work in the different wheels are called *hulls,* the literal meaning of which is a *stye;* and a visit to some of them would convince any of my readers that it would indeed be difficult to select a more appropriate appellation. * * *

Boys are apprenticed to the lighter branches at from 9 to 13 years of age, and to the heavier branches of grinding at from 12 to 14. Some go to the trade even younger than this. In my recent visit to the wheels, I met with one boy only 11 years old; he had been in the hull since the age of eight: he had a fearful cough, and, on examination, I found the upper portion of both lungs extensively diseased. * *

The following table will show the immense quantity of steel-dust that must of necessity be created in the first process a razor undergoes on the dry stone.

Table II.—Showing the weight of a dozen of razors in the different stages of their manufacture.

Shape of the Razor: Quill Backs.

	lbs.	oz.
Twelve razor blades, forged in the rough	2	4
Twelve razor blades, shaped	1	15
Twelve razor blades, finished	1	10

Loss in shaping, five ounces per dozen, principally on a dry stone.

Loss in grinding on the wet stone, five ounces per dozen.

Shape of the Razor: Swaged Backs.

	lbs.	oz.
Twelve razor blades, forged in the rough	2	0
Twelve razor blades, shaped	1	10
Twelve razor blades, finished	1	8

Loss in shaping, six ounces per dozen (dry).

Loss in grinding, two ounces per dozen (wet).

The above varieties of razors have been selected as patterns generally in use. * * * Great friction is required to grind a razor to its proper shape. Razor backs are for the most part round; and the pressure during the process of shaping is so great that no wet stone could sustain the rolling friction; the stone would soon become uneven, like a hammer-stone, and so pulverised that, after shaping four or five blades, the workmen would be unable to hold the blade on the stone. Forks, razors, table-knife-bolsters, scissors, shanks, and needles, undergo the rolling process, and consequently require the dry stone. * * * In shaping razor-blades, &c., on the dry stone, an immense number of red hot particles of steel fly about in all directions; from these "motes," as they are called, the eyes of the grinders were constantly injured, and in some cases permanently lost. * * * In shaping a dozen large razors on a stone seven inches in diameter, the stone would be reduced nearly one inch.

During the process of dry grinding (and in dry grinding the greatest danger to the workmen arises), the dust which is created from the stone and the metal pervades the room in considerable quantities. But it is not only in grinding that dust ascends; much of the evil resulting from the trade of a grinder (and to this dry and wet grinders are alike liable) proceeds from "hanging" and "racing" the stones. * * * During the operation, the rooms are unavoidably filled with dust; the dust also arises in perfect clouds when the sides of the trow are swept, after the process of racing is over: it takes about half an hour to race a large stone. * * * Much dust is also created in glazing and polishing; the amount will depend in a great measure on the nature of the glaze used; that employed in the glazing of forks is the most injurious. * * *

Fork Grinders.—The men employed in grinding forks work on a dry stone. It is by far the most destructive of the grinding trades carried on in Sheffield. * * * It is an undoubted fact that a great many of these men are cut off before the age of 30; and that, if commencing, as most of them do, the trade at 10 years of age, at the age of 21, if constantly at work, the expectation of life would not most certainly exceed 14 years. The calculation of Dr. William Farr, in the sixth report of the Registrar-General, of the probable duration of human life in England at the age of 21, is 39 years; so these unfortunate men, we may conclude, are exposed to influences which have a tendency to rob them of 25 years of their lives, to deprive to that extent their wives and families of the benefits of their labour, and to fill the union houses with their widows and orphans. No more graphic picture can possibly be drawn of the effects of this trade than in the address presented some years ago by the fork-grinders to the public; they said: "It is part of our duty to allude to the " destructive influence of our trade; for be it known " that, in respect to the pernicious effect of grinding " trades upon health, our branch is by far the worst. " We can show by irresistible facts, drawn from the " statistics of our trade, that the average age of fork-" grinders does not exceed 30 years. Nor is this to " be wondered at, considering the poisonous atmo-" sphere we have to breathe, which renders the far " greater part of us mere shadows of men, and pro-" duces a complication of diseases, of which the most " formidable is the asthma and dry cough, known by " the name of the 'grinders' complaint,' attended as " it is by consumption, which no medical man can " cure. In such cases, life is a burden to the poor

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* I am informed that the number is now greater.—J. E. W.

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" sufferers, and their frames are gradually emaciated " and wasted by a repetition of slow tortures." This is unfortunately an "o'er true tale." * * *

The following table shows the number of grinders at present employed in the different branches of the trade, and the average ages of all the men now living, those under 21 being excluded.

Table III.

Number of Grinders, 1857.	Men.	Boys.*	Average age of all the men now living.
1. Forks - - -	160	120	29
2. Spring knives - -	685	600	34
3. Razors - - -	300	220	31
4. Scissors - - -	300	200	32
5. Table knives - -	800	250	35
6. Edge tools and wool-shears -	200	80	32
7. Saws - - -	160	50	38
8. Surgeons' instruments -	15	12	—
9. Files - - -	160	85	35
10. Sickles - - -	50	20	40
11. Jobbing grinders - -	280	210	—
Total - -	3,110	1,847	—

	Total men - - - -	3,110
	Total boys - - - -	1,847
Add about	Scythe grinders (men and boys) - -	60
	Needle grinders - - - -	12
	Number of grinders in and near Sheffield	5,029

* * * The Soho wheel has 50 hulls, and, on an average, 500 men and boys work at it. The Union wheel contains 46 hulls, and from 300 to 400 men and boys are employed. (Dr. Hall on personally taking down the ages of all the men employed in these two wheels found the averages correspond almost exactly with the ages given in Table III.—J.E.W.) * * * The average age of the fork grinders at these wheels was only 28. At the Soho wheel, a fine young man, a fork grinder, aged 26, remarked, "that he reckoned, in about two more " years, at his trade, he might begin to think of " dropping off the perch;" adding, "a fork grinder " is an old cock at 30." The average age of all the grinders in the different branches at work at the Union wheel was 34, and all boys under 21 are excluded from my calculations. * * * The Union and Soho wheels are both first class wheels, and the mortality at them may be considered below rather than above the usual mortality.

The average ages of the grinders at death, at some of the principal wheels, are given in the next table; and the great majority of the grinders (probably eight out of ten) work at about 10 large wheels; the rest at small wheels.

Table IV.—Average age at death of Grinders at the following Wheels.

Name of Wheel.	Return of Deaths since the Year	Average Age at Death.
Messrs. J. Rodgers and Sons	1836	42
Union Wheel - -	1850	40
Soho Wheel - -	1845	40
Old Park Wheel - -	1844	41
Suffolk Works - -	1845	38½

* * * * * *

In dry grinding, very often before the age of 20, evidence is afforded of the existence of grinders' disease. The breathing is difficult, particularly when ascending a hill, or the steps leading to the hulls in which they work, and the shoulders even at this early age are often elevated in order to relieve the distress occasioned by shortness of breath.

The cause of this disease is, first, the irritation produced by the metallic and gritty particles inhaled in grinding, in "hanging," and in "racing" the grinding stone; and, next, the constrained position in which the men labour. To this must be added the working for many hours in a badly ventilated room, and the very unpleasant smell produced by the friction of the steel on the grinding stone. When at work, the grinder sits astride of what he calls his "horsing;" this is a low, narrow, wooden bench; his elbows rest upon his knees, and his head, particularly when employed on very small articles, is bent over the stone. The position is a very injurious one, and when long continued, is calculated most unquestionably to induce pulmonary congestion.

Again, in many of the heavy branches, such, for example, as table-knife grinding, the men work in the coldest weather without either coat or waistcoat, with their handkerchiefs off, their shirts open, and their chests fully exposed; and this too in a room every bit of the glass from the windows of which has been removed, that the light may not be obstructed by the splashing of the water rendered dirty by the grinding stone. The work is very laborious, the men perspire freely, and in this condition they will often leave the hull without putting their clothes on, and recklessly lounge about in the yard even in weather as bitterly cold as we have had it this winter. Inflammation of the lungs, pleurisy, rheumatic fever, and diseases of the heart, are consequently not unfrequent amongst them.

The workmen in other of the Sheffield trades suffer from inhaling dust as well as the grinders. Bone scale cutters, ivory cutters, and the girls employed in the hair-seating manufactures, especially when working with foreign hair, suffer more or less from the dust. * * * * * *

Prevention of the Grinders' Disease.—Can nothing be done to prevent, or at any rate to render less fatal, the occupation of a grinder? This is a question of national importance, and one well deserving our most serious attention. Formerly this disease was unknown, and for this reason; until the year 1786, when the first steam wheel was erected, grinding was not carried on as a distinct branch of trade * * * The particles of dust and steel not carried away by the fan in racing a stone may be prevented from entering the air-passages by a very simple contrivance, consisting of a piece of wadding sufficiently large to cover the mouth and nose, enclosed between two pieces of silk, and secured by a band of elastic to the back of the head.

That the fans, or, as the grinders call them, "*fannies*," answer perfectly, I have convinced myself by actual experiment; and I have also received the unqualified testimony of all the most intelligent dry grinders who use them of the advantage to be derived from them. A razor grinder at the Suffolk Works wheel assured me that but for the fan he should not have now been living; and he said, "If I were to " shape twelve razors without a fannie I could hardly " breathe next day; with a fannie I can shape them " and feel as well as ever I did in my life."

To those who are not as conversant with the economy of a grinding wheel as myself, the question naturally suggests itself, how comes it, that with a contrivance so admirable and so effectual for carrying off the dust from the steel and grinding stone, the mortality is so great? I am sorry to say that these fans are far from being in general use. In some wheels I did not find one; and I went into hull after hull in other wheels where the men were humping scissors, shaping razors, and grinding forks—the most destructive kinds of grinding, as we have seen—without finding one at work. In other hulls one man perhaps was at work with a fan, and the next was destroying himself and his fellow-workmen by grinding without it; in another the man at the end *trow* had put up a fan that would serve the whole hull, which he charged, perhaps, each man a penny a week for; the man next him paid for the fan, but not having been at the trouble to fix a box, it was useless to him. Others had the fan fixed, but not at

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* *i.e.*, all under 21.—J.E.W.

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work; "the noise was too great for them." And (I blush to write it, but such was the case) some dry grinders told me, that "the trade was bad enough as "it was; and if the men lived longer it would be so "*over full* there would be no such thing as getting a "living." The cost of a good fan is from 30*s.* to 3*l.*

Allusion has already been made to the age at which boys are taken to work at the wheel. To send a boy at 8 or 10 years of age to work at polishing forks, in a grinding hull, is an act of refined cruelty which the powerful arm of the law can alone restrain. The application of the Factory Act to the Sheffield grinding trades would, in my opinion, be most wise and salutary. These helpless children I would indeed commend to the protection of the State; and glad indeed shall I be if these remarks attract the eye of any member of the House of Commons and induce him to bring the question before Parliament; or if the evils, moral and physical, under which these poor boys are suffering, lead the inhabitants of Sheffield to petition the Legislature to throw around them that protection which they have not at present. The early age at which these boys are made to work, and the many hours during which, day by day, they labour, render it impossible to give that general instruction, and religious training, which we have a right to see extended to all classes in a Christian land. The immense competition that exists in many branches, the manufacture of articles to supply the "Cheap Johns" and others who frequent our markets and fairs—articles which are made for *sale* and not for *use*—has doubtless caused many more boys to be employed than would otherwise have been the case; the men remarking, with some degree of justice, that inferior goods are charged so low that they are obliged to make boys work with them or they could not get a living.

The present high rate of mortality amongst the grinders in Sheffield, I am certain, may be diminished by—

1. Reducing the hours of labour.
2. Preventing boys from being apprenticed to the trade so young as at present.
3. Obliging all dry grinders to use a fan, and to keep it in active operation.
4. Preventing dry and wet grinders from working together in the same hull.

I. *Reducing the Hours of Labour.*—It is a notion in Sheffield that a drunken grinder often lives the longest. This is a very great mistake; for intemperance has hurried hundreds of these men to the grave. * * * The truth is, that the drunken grinder is much away from the wheel: he does not work so many hours at his trade as a steady man, and thus escapes the evils which arise from the dust, and the injury to his lungs which a long continuance of labour, day after day, in a constrained position must occasion. By limiting the hours of labour, time would be afforded for indulging in out-of-doors pursuits—in exercises which would bring the different muscles of the body into play, and have a tendency to prevent some of the effects resulting from bending over the wheel when at work. It must not be forgotten, that until grinding became a separate branch of trade, and steam-power enabled the labour to be constant, the disease which forms the subject of our present inquiries was hardly known.

II. *The prevention of children entering the wheel at an early age* would afford an opportunity for the body to develope itself on the one hand, and that needful education to be given on the other, which would remove the fearful ignorance at present existing, direct the mind to pursuits which are ennobling, and give to the Sheffield grinders, as a body, a position in the social scale to which they have never yet attained. With the removal of the present state of ignorance, the importance of those general hygienic principles so conducive to health and to longevity would be more generally adopted, and the wheel well ventilated, kept clean, and frequently whitewashed, and no longer regarded as a place "only to work in," and of no importance whether clean or dirty.

3. Another Sheffield physician, Dr. Holland, formerly physician to the Sheffield General Infirmary, who has also written upon the mortality and diseases of grinders, referred me to his publications on the matter, which contain full statistics, showing a fearful rate of mortality amongst some kinds of grinders. The date, however, of these publications is full 20 years back, and since that time some improvement has been made, especially owing to the use of the fan, and in the pen and pocket blade trade to the substitution of wet for dry grinding. But the condition of many grinders, especially fork and other dry grinders, of whom numbers still do not use the fan, remains the same as then, and I accordingly extract from those publications a few of his statements, as apparently equally applicable to such grinders at the present time, especially as more now work with steam power.

4. *Fork Grinders.*—At that period (*i.e.* from 1820) one-fourth of the number employed (*i.e.* of those over 21 years of age) died every four years, a rate of mortality exceeding everything previously known in any branch of manufacture, or in any pursuit or occupation. * * *

Comparison at certain ages out of 1,000 deaths above 20 years of age.

Ages.	England and Wales, 1830–39.	Sheffield generally, 1837–41.	Fork Grinders.
From 20 to 29	160	184	475
„ 30 „ 39	136	164	410
„ 40 „ 49	126	158	115
„ 50 „ 59	127	155	—
„ 20 „ 60	549	661	1,000

This trade had, in 1820, 80 adult workmen, and in 1841, 97 (with 100 boys, 39 of them between the ages of 10 and 15). * * *

It is found on examination that amongst the 97 men about 30 are at this moment suffering in various degrees from the disease peculiar to this occupation, and which is known by the name—grinders' asthma.

Razor Grinders.—The adult workmen employed are 275,* and of the following ages:—

From 21 to 25 - - - 102

„ 26 to 30 - - - 52

* * *

Of the 275, 154 are actually under 30 years of age, and above 45 only 20. * * * *

Deaths at particular ages out of 1,000 at all ages above 20:—

Ages.	Razor Grinders, 1822–42.	Sheffield generally.
From 21 to 25 -	121	94
„ 26 „ 30 -	215	90
„ 31 „ 35 -	209	85
„ 36 „ 40 -	204	83
„ 41 „ 45 -	137	80
*	*	*

Among this class of grinders 749 out of 1,000 die under 40 years of age, but in the town only 352, actually less than one-half. * * *

We are anxious that these facts be clearly understood, anticipating that the time is not far distant

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* The number of apprentices given at that date is 123. In 1858 the number of men and boys was 444.—J. E. W.

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when the legislature will deem it necessary to interfere to arrest the progress of evils which admit to a considerable extent of remedial measures. * * * The razor-grinders, in common with grinders generally, labour under peculiar hardships. In consequence of the destructive nature of their pursuits they are mostly excluded from the advantages of sick clubs or benefit societies. * * * And be it remembered [their so wretched physical condition is one] which is not the inevitable result of the occupation, but arising principally from the want of a system of ventilation, neither complicated in its mechanism nor expensive in its construction.

The facts which measure the rate of premature death measure also the misery and disease which precede it. The transition from health to the grave is not a single step. * * * According to these (*here omitted*) returns one-third of the artisans (*e.g.* from the age of 23 to 30, 22, from 31 to 35, 25, &c.—J.E.W.) are actually suffering from disease (arising from the occupation) and which in its advanced stage admits of no cure.

The circumstances which abridge life fall also with peculiar severity on the young employed in the trade. (*Vital Statistics of Sheffield, by G. C. Holland, Esq., M.D.*, 1843; *and Mortality of Grinders, Part III., by G. C. Holland, Esq.*, 1842.)

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5. The case of a child of 8 years old (b. No. 6), engaged in work of a specially injurious kind, needs a short notice in addition to his own statement. His pale face and squalid dress show his body to be as uncared for as from his manner and answers his mind seems to be. His father, with whom he works, was away (late on a Wednesday afternoon), and, if my conductor was right in his belief, drinking; to which habit the employment of so young a child at such work was attributed. The work on which the boy was engaged when I saw him—viz., grinding cast metal scissors—is of just the same kind as cast fork grinding, the unhealthiest kind of grinding known, and he had no fan. It was mournful to feel, as from these facts, read by the light of other evidence, I could not help feeling, that this child is almost certainly doomed to much suffering and early death, probably at latest by the age of 30, perhaps much earlier; and that this sacrifice is in no way needed for the public good, but might easily be avoided by common feeling and care on the part of a parent. The wheel in which this boy and Nos. 7, 8, and 9 work, viz., the Soho, a public wheel, is stated by Dr. Hall to be a "first class wheel" and one of the largest wheels in Sheffield. It appears to be *the* largest as to numbers. (Cf. No. 2.)

6. *William Henry Widdicombe*, age 8.—Am grinding metal (*i.e.* cast) scissors on a dry stone. Glaze for about a couple of hours in a day, and grind dry the rest. There is no fan. Work for father, who is a grinder in this hull. Was 8 last May, and have been here now (2nd November) six months.

Cannot read. Sometimes go to St. Stephen's church. Don't know who Jesus Christ was, or if He was a man; I've never heard about Him. (This was repeated two or three times in answer to my attempts to get the knowledge out of him in other ways.—J.E.W.)

7. *James Higgins*, age 7.—Come to the wheel every day at 12 to wipe knives for grandfather. Stay here till about 4 or 5 o'clock. Never went to school.

8. *George Greaves*, age 15.—Grind scissors, wet, and glaze. Have been at it five years. Went to work at 8 years old, putting scissors together. It was at a factory. Have had this cough ever since the flood. Was turned out then at night without clothes and all wet, and have never been well since. It hurts me a good deal up here (top of chest) and often. Was well before, except when I had the dropsy at 4 years old.

[Puny; looks full 3 or 4 years younger.]

9. *William Holt*, age 20.—Grind gimlets and bracebits, and sometimes skates. Am grinding dry half of the day or more. Feel the dust in my stomach here (chest), but no pain. Can taste it in my mouth when I get home at night; that's just when I do taste it. Cough up black stuff then, and in the morning also before coming to work.

Have no fan. It would be better to have one, but I am not my own master. Master doesn't have one for himself. If I were my own master I think I should have a fan in this trade.

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10. *Thomas Darwin*, age 6.—Grind bolsters (on a dry stone) and glaze in the Globe wheel with father. Don't know how long I have been at it.

> [Another boy says that it is nearly a year. His working so young was attributed by a man acquainted with the grinders to his father being given to drinking.]

11. *Thomas Darwin*.—Grinder at Globe wheel. Am father of that boy (a. No. 10). Have had him with me at work about three months. He comes and goes when I do. The wheel runs from 7 to 7 most days, and till 8 on Friday. He grinds on the dry stone and glazes, but grinds the longer of the two. Began myself when I was 8 years old. The work is obliged to suit my health, else it wouldn't.

12. *William Brown*.—Cast fork grinder at same wheel. Began this trade at 10 years old. Worked a many a year without a fan, but for the last 18 have had one, and should not like to work without it now. Have found great benefit from it, and any one would that works dry. Before I had it I used to feel the dust upon my lungs. Now I can work full days and am pretty well for health. Am hoarse now because I have a cold on me. Have been in a sick club 24 years and only had three weeks pay out of it; am now 47.

My fan works for my three troughs, for the dry grinding, glazing, and all. There is a deal of dust from glazing. It cost me 35*s.*, and 18*s.* more for fittings. There is only one gas light in the hull, the man on the far side lights his candle.

Have known boys begin the fork trade at 7 or 8 years old, but I wouldn't take a boy so young myself. Reckon that 12 or 13 is as soon as boys are fit to begin this work, but there are many as send them younger. Have had one come to me as young as 12, and he had been at the same job with some one else before.

13. *Joseph Else*, adult.—Fork-grinder at same wheel. Began this work at 8 years old, was not 8. Worked the full day then and only went away to dinner.

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14. *Joseph Sanderson*.—Fork-grinder at Sanderson's wheel, Carver Street. Grind steel forks part of my time, perhaps a third, and metal forks the rest. The hull is very small and the five troughs crowded side by side as close as they can be. There is a fan which acts for all the five troughs. It was put up by the proprietor, and with the fittings complete for all the 10 workers cost probably about 5*l.* We do not pay anything more for it. This used to be required sometimes I believe, but now fans are more common, and I do not think that they are charged for.

There is no comparison between working with a fan and without. Men did not live beyond 35, and now there are some as old as 60. Have worked with a fan for the last 15 years, and am now 49.

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15. *Thomas Roebuck.*—Fork-grinder at Askham's wheel. Began fork-grinding when I was 10 years old, and have been at it 28 years. In 17 years I have only had one week's pay out of two clubs, but such health at this work is unusual, and I've always been very steady. Boys however don't ought to begin before they are 14. They get strong by then, and know what the thing is, and can use every precaution. I had two boys, but I told their parents they had better take them away, and I have none now. If they begin young they go off like dyke water, so quick. I know one that began at 8 years old. He was quite fresh up to 17 and died at 19. His lungs were completely gone with the grinders' complaint.

The cast fork grinding is a deal more pernicious than the steel. At the former the average age of grinders is only 28, Dr. Calvert said. I don't think that above eight or nine have worked beyond my age.

About five years ago I put up a fan for two troughs at my own expense and find great benefit from it. It cost me 4*l.* 10*s.* But when I work hard I feel a pain in my side still, because you cannot get rid of all the dust.

We find all our implements, *e.g.* stones, bands, &c., everything in fact but power and fixtures, for ourselves. The rent paid is 6*s.* a week for two troughs, or 3*s.* 6*d.* for one. This is the general way all over Sheffield. The grinder's average time of work in Sheffield is nine or ten hours a day.

The cast fork grinding forms a separate trade, and is done in Sheffield alone. There are 84 men and between 40 and 50 boys in it, about a dozen of them, say, as young as that one (No. 16), *i.e.* 10. I know the numbers, because I have been a collector, and as such have gone round to all. There are about 34 or 35 men, and not more than a dozen boys, who are steel fork-grinders. This is a more particular job. It is done more in the country than in the town.

I have never known any one killed at the work, though I have known two or three lamed, *i.e.* break a leg and so on. Sometimes a stone flies out. This is very dangerous if it is a boy at work, because he has not sense to get out of the way.

16. *John Sale,* age 10.—Glaze forks at same wheel. Have worked at it two years. Come to work at 9 and 8, and sometimes at 7 and 6 a.m. All this week have come at 6 a.m. and worked till 9 p.m. An hour for dinner, but no breakfast; get us breakfast before coming to work. Have no tea; not when I stop till 9. Feel very hungry without it. Earn about 5*s.* a week, and give it to uncle.

Haven't been fit to go to Sunday school. Think I am going at Christmas.

17. *John Brown,* age 15.—Fork-grinder at same wheel. Have been a grinder five years. Dare say I grind nine hours a day usually. Wear these glasses to keep the dust from my eyes.

> [The sparks keep firing the board in front of him all the time.]

18. *Patrick Stavin,* adult.—Fork-grinder in Shirtcliffe's wheel. Began grinding forks, cast metal like these, at 9 years old. Boys are generally about 9 or 10 years old when they take to fork-grinding. First they learn to grind on a stone, then to glaze, and afterwards finish like a man. All is done dry. Master made me work the full days, *i.e.*, on the average 10 hours, always from quite the first, and on Friday till 8 p.m. He was often off himself, perhaps for a whole week. His being off made more for me to do. He would say, "Now rush in and get on with the work." When I was older I had to work harder to make up for the man being away, but when I was a young boy if master was away I used to skulk too if I could. Of course if we skulked we had to fetch it up.

There is a fan in this hull, and it is fitted to my trough, but I don't use it; the pipe is choked up. It would cost me nothing but perhaps half a day's labour of my own to clear it, but it is only a pot pipe, and would never draw well, and would soon clog up again at the bend. It should be metal.

I have had a "very deal" of cough, especially lately, and have been complaining to mother about it and the pain in my back for the last three weeks. Was at soldiering three years. Am not so well now as then. Am 25.

19. *Thomas Rider,* age 11.—At the same wheel. Now hollow augurs. Am always on a dry stone. Have no fan. Began fork-grinding when I was going in 10. Grind from 6 a.m. till 5½ p.m. every day, and till 4 on Saturday.

20. *George Hobson,* age 19.—Grind joiners' tools on a dry stone all day. Work for a master. Have no fan.

21. *Henry Shawe,* age 10.—Work in Bacon's wheel, Holliscroft. Have been in a wheel more than a year. Am buffing table knives. It makes my back ache.

Cannot read at all. Don't know, I'm sure, how many pennies there are in half-a-crown.

> [A boy of 12, who glazes in another hull, has been at the work 3 years.]

22. *John Holt,* age 13.—Glaze and polish at Wade, Wingfield, and Rowbotham's wheel. Get 3*s.* 6*d.* a week. First went to work at 6 years old as engine tenter, and had to make the fire up. It was at another wheel, and it went from 7 a.m. till 7 p.m. usually, some days till 8, and some days till only 6; about the same hours as it does here. Father is a spring-knife cutler; he did not work at the same place.

Was at school before I went to work and go every Sunday now. Cannot read very well, but can read a bit and write.

23. *William Attersby,* file grinder at Globe (Unwin and Rodgers') wheel.—We file-grinders grind wet. My stone looks so dry because if I had much water it would take the cut off the stone too much. It is not at all healthy work. I feel 20 years older than I did 7 years ago. I began at 10 years old and am now 39. File-grinders' average age is only 32. I know this because I was asking our secretary the other day what it was now. I buried one brother at 29, another at 39, and my father died at 36; all three were file-grinders. One brother died of the grinders' asthma, the other broke a blood-vessel. He was working too hard in Bull week, and hearty like me when it happened, and we buried him the Sunday afterwards. He had always done his self with work, like me. It's very hard work; I could make myself sweat at it in the coldest day in winter; look at the sweat now. The father of my lad there died of grinders' asthma too. He had been about a twelvemonth going off.

I am pretty strong for a grinder, but I only work 7 or 8 hours a day, though the wheel runs 12. The handkerchief over my face is because I have the tic.

I am obliged to be off work for a week or so sometimes, but never have a real illness. I often feel tight across the chest, and when I get up in the morning am what we call "coughing and barking."

We find the files much more unwholesome than they were formerly. They put so many more things in the steel now; "physic" we call it. A kind of nauseous smell rises from it. Cheaper the steel is, and the more physic it has. That is the only way in which we can account for the difference. The common kind

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for rough work is the worst, and there is a great difference as to the kind of file.

My lad there (b, No. 24,) grinds the rough scale off the files, "horeholding" we call it, for me before I grind them. That is more injurious a deal, but I am obliged to let him do it, else he would be no use to me. He does it all day, never no change.

The stones will fly sometimes, especially if the engine goes too fast. When you go to a new wheel you put a big pulley and regulate the pace of your stone till you get to know the pace of the engine. A good engine will run pretty well one pace. This is one of the best engines in the town, but three years ago the governor got wrong. A man happened to be racing his stone, and this made such a noise that it was not noticed that anything was wrong. My stone flew out of the door and across the yard there, and knocked a hole in the wall of the shop opposite. The two men who usually work there were not in, or most likely it would have killed them. You cannot help stones breaking sometimes, *e.g.*, if there is a hole in it, but having plates, like mine has, instead of wedges is a great thing. (The boy's stone has only wedges.—J.E.W.)

The mites are very bad for our eyes. I have been so with them that I could not sleep for nights. I have seen me called up at 3 or 4 in the morning to take them out grinders' eyes. That man, who came just now for me to take his mite out, has come to me three or four times in a night to do it for him. Sometimes they burn so much more than at others. I do not wear glasses because I cannot see to work in them.

The wheel runs 60 hours a week; on Thursdays and Fridays from 7 a.m. till 8 p.m. It stops an hour for dinner, but not at any other time, and on Saturday it runs from 6 a.m. till 2 p.m. with no stop, and we only just leave off long enough to get a bit of breakfast.

There is no question but a fan would do a great deal of good at wet grinding as well as in dry, if we could have it. But so much wet flies off the stone that a fan would not carry off. You can see how thick it cakes on the board opposite. In a short time it will be as thick as that (9 inches).

[Though "pretty strong for a grinder," this man had pale hollow cheeks, and seemed to have some difficulty in breathing. He is, I was informed, one of the most intelligent men in the wheel.]

24. *George Stevens*, age 15.—Grind files for last witness. Began file grinding for father at 8 years old; was going in 8. Did not work a full day for some months. Am hoarse, but have always been so. Feel no pain anywhere and can breathe well.

Was getting to reading at school when father took me to work. Go to school on Sundays.

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25. ***Joseph Travis***, file-grinder, now in-patient at the Sheffield Infirmary.—Till 12 years old I helped at farm work, and it would have been a good job if I had kept to it. I then went to file grinding. It is a destructive trade, though the grinding is done wet. It works in two ways. First, you must stoop over it so, and have all the weight to throw from the chest, and it is very heavy work. Some files are 13 or 14 lbs. It is not as if anybody were working loose and free. Besides this, it hurts the breath, owing to the steel and the smell of sulphur. The steam rises, especially when you take up the file to look at it, and the steam has stone and iron in it, which get inside you and set there like steel itself. You can taste it as plain, and spit as if you were spitting steel.

Till the last four or five years I worked pretty regular, but not so much since on account of my health, though till within the last two or three years I have been right enough in summer time. But I ought to have given it up some years ago. By 40 it had got hold of me, the asthma, we call it; there is no remedy for it. Before that I had not found it so much, but always after working hard I had felt the steam in me and found my breath bad. I was pretty steady in the fore part of my time, but have drunk my share for the last 20 years. Drinking, however, has, I think, nothing to do with it. I have seen some "go off" without drinking, and others, who have drunk hard and worked hard, go on longer. There are only two or three men, I should think, in the trade older than I am, viz. 55. They seem to rot off at 34 or 35, and some at 23 or 24, according to their constitution.

Those who begin young must be taken hold of more than those who begin later. A lad ought to be strong constitutioned for it, and 14 or 15 is plenty soon enough. Some go at 13 or 14, and I have known some put to it by 10 years old, but they don't ought. It's their own fathers have put these young ones to it, and they (*i.e.* the boys) have been ruined before manhood. Consumption seizes them when quite young men, and they go off like nothing. I have had a many boys working for me, as many as 5 or 6 at a time when trade was good, and I know how they have gone off in constitution. There's a many of these that's dead as young men; I cannot say how many, but nearly all.

"Racing" a stone makes such a dust that you cannot see in the place. It only ought to want doing when the stone is new, but it all depends on the stone; it may be wanted oftener. You can put something over your nose and mouth when racing, if you like. "Hewing" the stone also makes a deal of dust, which rises at every stroke. It is done while the stone is standing still, so that the dust could not be got rid of by the fan. The stone is never carried outside the hull for this. Sometimes a stone will run a full hour without needing it, sometimes half, but as the stone gets less it wears off quicker. Small stones are handier for small work. Boys work at smaller stones, taking off the rough part of the files for their fathers, who finish them on the larger stones. The boys' work is more rougher and sulphury like, because a sort of shale comes off.

Stones are of all sizes, from 4, 5, or 6 feet diameter down to 20 or 18 inches or less. A common useful size is, perhaps, 4 feet. Some are a deal kinder than others, and would get down a foot in no time, *e.g.* a 4 foot stone a foot off in a week, and a smaller in less time.

The floor in a wheel is generally nasty and damp. There's a many take cold from their feet being continually wet: that's a great matter with 'em. But it might be easily kept clean and dry with a little extra care and trouble. I always made my men keep the side clean, and had a little channel close by to let the water run in. Some wont have a dirty place, and some think it too much trouble to avoid it. They ought to be forced. Some too can make dirt at any business, and at this some keep themselves clean, and some get very wet in the chest and thighs. Another thing that leads to colds is that some of the hulls are very cold and draughty. There is sometimes no window, *i.e.*, the panes are all broken out. Some may be broken by accident, or sometimes men smash them in summer time because it is so warm, or at other times because the panes are so dirty and hinder the light. Windows might, however, be made so as to open. When they are broken the men won't repair them and the landlord won't. In such a place in winter, what with the draught of the stone and the cold of the metal, I have seen the things all over ice that thick, if you have left it a short time, so that you have to break off the ice to begin again. But there is usually a good fire, which the landlord finds out of the rent. There is no comparison between working in a warm and cold place.

Some are very dangerous nasty places in winter time from want of light, and accidents are more likely to happen in consequence. Some grinders have gas, *i.e.*, if they pay for it and the fitting themselves; and they are gainers by it, as they can do their work so much better, especially if it is fine and wants close

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watching, *e.g.* scissors. Others have candles, put in a small box to keep the draught of the stone away.

Wheels are a good property, but there is a deal of room spoiled by making the most of it for getting rent. This is paid according to the amount of power and the kind of trough used. They reckon about 6*s.* 10*d.* a-week, or 17 guineas a year, for a trough for one file grinder. Small things are much less.

There is many a time that accidents happen. At one manufacturer's a file-grinder got caught in a band some way and was killed there and then, before ever they could get the engine down. It pulled him limb from limb, and they had to pick him up in a basket.

Boys after a few days become able to throw a band off, not so well, however, as a man, because they have not the proper power perhaps, and there may be some cases where it is not advisable for a boy to do it. There is no difficulty in boxing off the machinery, except the drums; these could not be got at if they were covered. The machinery which caused the accident just spoken off had been ordered some months before to be boxed, but it had not been done. The machinery, drums, and troughs are of much the same kind in all the different kinds of grinding.

Some things, as forks, are ground all dry; and some, as scissors, edge tools, bracebits, only in part. Where there is much "roll" wanted, as in forks and in the shanks and bends of tools, &c., and hollowing out insides, the stone must be very hard, and therefore used dry. The fan is the best invention that ever was, I should say, if attended to, and it is not difficult to keep in order. There are, I should say, now going on for 400 dry-grinders, most of them in Sheffield, and a few at water wheels in the neighbourhood. I remember when there not above 60. Perhaps, with boys and all, there are nearly 500 now.

In the file-grinding trade the hours are usually from 7 a.m. till 7 p.m. in summer, and in winter from 8 a.m. till 7 p.m., and sometimes before Christmas till 8 or 9 p.m.

File hardeners work in factories, and the files are likewise scoured there by women and girls, and are then ready for wrapping up. The scouring is hard work for girls.

26. *Edward Sotheran*, scissor grinder.—Now a patient in the Sheffield infirmary. Began scissor grinding when between 9 and 10, and am now 27. Ground the scissors on a stone, then lapped them on a lead wheel, and afterwards glazed them. Did not begin to finish till I was 13 or 14. The doctor said that it was working on lead that caused the weakness in my wrist. It had felt weak for two weeks before I had to leave work. Another who worked at the same wheel with me said that his hand was just the same.

When I was about 15 or 16 a cough came on me, and when I was about 18 I had a pain in my back when I coughed. Thought I should "go off." Left work for about eight weeks then, and have been very weak ever since, but I can get on with my work. At the Union wheel, where I was two years, there was no "fanny" in my hull. Was at a smaller wheel, where we all did the same work, the rest of the time. There was not a "fanny" about the place there. The "properietor" would not let the master have one, because it made such a noise; we should have had one else. I think the master once axed. He (the proprietor) was such a queer chap; he would soon tell any one to go out of the place if they were not satisfied with it.

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27. *John Mason*, edge-tool grinder at Beardshaw's wheel.—Some of my work, such as I am now doing, viz., grinding certain parts of chisels, must be done on a dry stone, but this does not take more than an hour or an hour and a half in the day; the rest is all wet grinding. Brace-bit grinders will be grinding dry for a whole day sometimes. I began many years ago, very young, and have worked in five or six different wheels, but never had a fan in any. It is the best plan that ever was invented. The reason why grinders do not use it more is that it is a bit of expense. A fan for this hull, with pipes for each of the 12 troughs, so as to give the benefit to all, would cost about 10*l.* perhaps.

There is one of the most extraordinary ideas here that ever was. The windows, which have all been put in lately, are made so that they will not open. If you came in when we were hanging and racing a stone, neither you nor any man living could see us for the dust. It hangs about for an hour afterwards. Grinders are in the habit of breaking windows on purpose. I have seen men sit at the back of the hull and try how many panes they could break at once by throwing things through. That rough class, however, is now fast dying out; they will not do now. We have a very respectable set in this hull.

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28. *Samuel Ellis*, plane grinder at Ward and Payne's wheel.—Began grinding under father when 9 years old. My younger brother there, now 17, did not begin till he was 12; a second son is not allowed till then, if the eldest is grinding for his father. The wheel starts at 8 a.m. most days. On Saturdays it starts at 7½ or 8, and does not stop till 4 p.m., but we just leave off work on Saturday to take some dinner; could not work more than four hours without. When I began I could work all day if I did not hurry myself, and worked harder as I grew older.

Got hurt once at glazing; the horsing was not properly fixed, and slipped and let me through down on the glazer. Was off work a fortnight for it, but not at the hospital. (Coughs). Have no cough, and nothing the matter with my throat.

Could read, write, and sum once, but now cannot write or sum, and cannot read a deal.

[Has a loose cough.]

29. *Henry Liddell*, age 14.—In same wheel. Grind bolsters on a dry stone and glaze. Have been in a wheel three years. Went to cutling at 8 years old and went errands.

Cannot read a deal.

[A grinder stated that this boy "has had a
" hard bringing up. His father was a
" great drunkard, and the boy has had to
" live with his grandmother since two years
" old."]

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30. *John Henry Wright*, age 14.—Grind files in Peace and Ward's wheel. Work from 7 till 7; the wheel stops for an hour at dinner but at no other time. Take dinner here. Work for father. My arms are very tired at night, and my back aches a very deal, but not my chest or in front.

Worked at cutlery with grandfather before, making scale tangs; he kept two boys besides. We began at 7 a.m., and reckoned to leave off at 7 p.m., but seldom did so till after 8, or perhaps till 9; it just depended; sometimes we worked till 10 p.m.

Was never at day-school, go on Sunday. Cannot read, only spell. The Queen makes the money.

[Face splashed from the grinding.]

MESSRS. JOS. RODGERS AND SONS' WHEEL, NORFOLK STREET.

31. This wheel, which is separate from the principal manufactory of the firm, is one of the best class. The hulls are light and lofty, but the wet grinding makes the floor sloppy. Fans are used here by men when grinding dry. One of them had fitted a fan also for the benefit of his apprentice, who polishes; but it is not now in use. It is said that the draught cools the metal and prevents it polishing so easily. It appears, however, to be desirable for the polishers, the branch at which boys usually begin, as well as for the grinders. An intelligent and experienced grinder here stated that he had known many youths to have the grinders' disease who had never ground, and he attributed this to the dust of the crocus powder, a preparation of iron, used in polishing, which is seen flying off from the wheel, and settles in front of the worker, and also finds its way into the nose in considerable quantities.

32. Other kinds of work, *e.g.* forging blades, making handles, and other general cutlery work, are carried on on part of the same premises.

33. *George Swift*, age 16, polisher.—Have worked in a wheel for four or five years. Work for my grandfather here and live with him, and get 9*d.* a week to spend. Work from about 7½ a.m. till from 5 to 6 p.m., and Saturday till about 3½. Get ten days or a fortnight's holiday at Christmas, three at Whitsuntide, two at Easter; sometimes on other days, as Good Friday, Shrove Tuesday, or the Fifth of November, and half a day on quarter rent days. Have good health; can breathe and eat well; have no pain anywhere. Am as well as when I was at file cutting.

Cannot read a deal. (Spells short words wrongly.) Have written in a copybook a little. Can do two or three sums. Glasgow is a state where the Indians live. Scotland a place where strange people are. A Scotchman comes from Ireland. Do not know the Queen's name. (*Asked by a grinder*, "Is it Mary?") Think that is it. Never looked on a halfpenny, or took notice there what it is.

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34. *Samuel Sharpe*, razor grinder in the Union wheel.—There are several processes in razor grinding, viz., grinding on a dry and on a wet stone, glazing on a wheel covered with emery, lapping on a lead wheel, and polishing with crocus powder. The fan is not ever used for wet grinding, and I do not see how it can be. There would be such difficulties of detail in applying it, nor is there anything like the same need for it as in dry grinding. It is the dry dust which is so injurious. Fine particles, however, do rise even from the wet stone, and if a fan or any other mode for carrying them off could be invented it would be a great benefit to the health of the grinders. This is my decided opinion, but I do not see how it can be done. There must be something in front, like that board, to catch the spray which is thrown off, and to let it run back into the trough, or we should lose the water. If the surface of this were glazed it would soon become caked over, and just the same as the board; and even if that could be prevented in any way it would dash the spray back in our faces. It is true that it might be put further off, and also that perhaps some means might be found of keeping up the supply of water in the trough without catching what flies off. But what injures us in wet grinding is not the spray which flies to the front of the stone, but the fine particles which rise under our faces. I do not see how these could be carried away. If a strong draught were caused there, being admitted from the back of the stone, it might be too much for us. Even polishing with crocus makes a dust which is inhaled. If a person who has been working at it spits or blows his nose he can see this very plainly. I have worked with a fan for dry grinding all my life. One fan which I put up for my three troughs here cost me about 5*l.* This does for all the workers, *i.e.*, two or three at each trough. The cost of fitting a fan will, of course, vary with the situation of the troughs; some might cost less. I have always had good health; I never had any asthma, or felt any difficulty in breathing in going quick up hill. In fact, I may say that I am perfectly well. I began the work at 11 years old, and am now 47. The usual age for beginning razor grinding is from 10 to 12. I have known some begin younger, as at 8 or 9 years old, but this was generally under their fathers. If boys begin the work young it takes more hold of them. I have had several apprentices, but never took one under the age of 14, except one of 13, and he was a fine lad for his age. When they begin very young, for the first six months or so part of their time is taken up with running errands, &c.

The horsing is too wide for young boys to sit on, and must be so on account of the width of the trough beneath. The usual width of the flat top of the horsing is about 14 inches. This wheel runs most days, with a stoppage of an hour for dinner, from 7 till 7, on Fridays till 8 p.m., and on Saturdays from 6 till 4.

There is, I think, generally a want of inclination amongst boys who work at grinding to attend night schools.

35. *Edward Armitage*, age 16.—Polish scissors in the same wheel. At 12 years went to grind hay forks; ground dry all day. The wheel ran the same hours as this. Like this work better than that. Found the dust on my stomach, and the mites got in our eyes.

Was never at a day school; don't often go on Sunday. Have just begun to go to a night school three nights a week; pay 1½*d.* a week for it. Can't read at all. Can't count what 7 times 5 is. There are 38—are 36 halfpennies in 18 pence. Don't go to church or chapel on Sunday. Can't tell what they call the Queen's name.

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36. *George Hobson*, razor grinder at Turner's wheel.—Have worked with a fan for many years. They are a great savation to a man's health, but take a great deal of trouble to keep in order; only razor grinders and some fork grinders use them. Never saw a brace-bit grinder with one, though that work makes as much dust as any. No country grinders use them, I believe, and in the town not half of those who grind dry or partly dry use them.

Have not very good health. Get a sup of drink; should be better without it, if any one could persuade me to do so.

37. *Mr. James Bingham*, manager of the razor grinders at Messrs. Wostenholme's manufactory.—The grinders here pay about 3*s.* 3*d.* a week each for a trough. Most of them put up fans for themselves; where they are put up by the master a further weekly sum is charged to the grinder till the cost of the fan is paid off. The only men who do not use them here are some who came from country wheels. Fans, I believe, are not much used there. Certain parts of the razors must be ground dry. To grind these parts on a wet stone would take so much longer time and wear down the stone so much. For pen blades much of the dry grinding has been done away with, but no such change has been made with razors. A razor grinder only grinds dry a small part of his time. The grinder shifts his stones as required, and puts water in the trough or not, or raises or sinks it to suit the kind of work. When I was first in the trade the average age of razor grinders at death was 34. Now it is much raised by the fan, and we have some men of good age. The effect of the work depends very much on the temperance of the grinders.

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38. *Mr. Joseph Mallinson*, secretary to the razor grinders.—The average age of razor grinders at death has been taken at different times, and usually estimated at 36, but it is now, I believe, 42. This change is owing to the more general use of the fan. Temperance and steady habits make a great difference to the effect of the work on the health; but I do not think that there has been much improvement in the trade as regards these. The health is more affected also if a boy begins the work when too young. I consider that 14 is as early as it is fit for boys to begin it; but have known boys, though rarely, put to it so young as 8 and 9. The youngest boys are usually working for their fathers. Besides the dust, the constant leaning over the work, which is necessary, is bad for the chest, and injures the digestion also very much. If boys begin too young they are stunted in growth, and sometimes even deformed and bow-legged, from sitting upon the horsing, which is too broad for a young boy. We are trying to fix a rule that boys shall not begin razor grinding till the age of 14. This is, of course, partly for the sake of the trade, but is also because it would be better for the health of the boys.

A person seldom finds the bad effects of the work till about the age of 20. I was 28 when I began to feel them, and I had begun work at the age of 14. I found difficulty in breathing, and had pain in the chest. I have now left off working three years, and there is a great change for the better in my health.

The fan could easily be applied to any kind of work in which dry dust is produced. I used it myself even at polishing. In grinding the kind of razors of which the largest quantities are made a man will be, perhaps, only an hour or so in each day working on the dry stone. If a grinder has a boy the boy will do more of the dry work than the man. Boys begin with glazing and polishing. The fan is used by many dry grinders, but by no means by all; I cannot say by what proportion, but should think that perhaps 7 out of 10 who do dry work do not use it. I attribute this more to the neglect of the men than anything. Steady men generally get one for themselves, but they may suffer from others who work near them and will not use it. A fan fitted for a single trough will cost about two guineas, and for a whole hull, with six troughs, perhaps four guineas.

There are now 276 men and 109 boys in the trade. The boys are from 21 years of age down to about 12, and a few younger. About 10 hours is reckoned a day's work. In country wheels grinders, if behindhand, sometimes make up time by running longer, working *e.g.*, from 6 a.m. till 9 p.m., and not stopping the wheel during the day, but just getting breakfast and dinner and then going on again. One grinder was in his wheel when the flood came, *i.e.*, at 1 a.m., and was swept away. If a man has a boy and is working long, he will often want the boy to work the same as himself.

I visit nearly all the wheels in Sheffield, though I have not worked in them but in the country. In some I have seen the bands and machinery very indifferent for safety. Few accidents happen from this cause in the country wheels, such as I have worked in on the Loxley and Rivelin streams; accidents of this kind are generally from carelessness, and men in the country do not put their sons on to work so early as they do in the town. I account for this by men usually being more frugal in the country, as there are not so many temptations to spend money, and so they can afford better to do without their sons' work, and to keep them at school a little longer, and the boys are altogether better cared for. But in the town, lads brought up to the wheel get a very poor education. Then they have so many ways of spending money, and they may be seen congregating in the street in the day, settling probably where they will go in the evening.

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39. *Mr. Jonathan Wragg*, secretary to the table-blade grinders.—Table-blade grinding is the largest of all the grinding trades. It includes knives of several kinds, *e.g.*, butchers' and shoemakers' knives, and nearly all large blades. As secretary to the trade I am well acquainted with its details. There are 700 men and 200 boys under the age of 21 engaged in it; of the latter a full third probably are over the age of 18. The usual age at which boys enter the trade is 12 or 13, and they are then apprenticed till they are 21. Many however simply work under their fathers. The master usually boards and clothes his apprentice, and gives him a little pocket money. As a rule the apprentices are well fed, clad, and treated, though there are of course exceptions. Both sides will sooner submit to a good deal of inconvenience than come before a magistrate. But such cases are not uncommon, *e.g.*, when a boy runs away, or a master ill treats him. Some, however, are more unfeeling than others, and set boys down to work sooner; this is usually the fathers themselves. I have known some put to the work as young as 9, but none younger. There is not much difference as to the age of beginning in the different branches of grinding. Even in saw grinding, which is the heaviest kind, and in which therefore boys, as a rule, begin rather later, light jobs can be found at which a boy of 12 or 13 is of service. Though there are several different grinding trades, grinders of all kinds work at the same wheels indifferently. The number of wheels in and near Sheffield has, I should say, on the whole, fully doubled in the last 20 years, though the number in the country round has rather diminished, some of the wheels being turned to other purposes, such as corn mills, and no new ones built. I could myself find 100 in Sheffield. The hours for which the engine runs are much the same in nearly all, viz., Mondays from 8 to 6; Tuesdays from 8 till 7; the next three days from 7 till 7, or in some cases till 8 on Fridays; and Saturdays from 6 till 3; the engine stopping in all from 12 till 1 for dinner, but at no other time. It would be well that it should stop for half an hour at tea; perhaps a quarter of an hour is taken. Men cannot work longer if they wish it, as the engine will not run. But few work the whole time. On the average, I should say, men do not grind more than nine hours a day Boys are sometimes at work while the men are away; there is sadly too much of this, as men come in at all times, and some days not at all. But on the whole the boys do not work much longer than the men. Table-blades, like articles of most kinds, are ground partly on a dry stone, partly on a wet one. It is only a few things which are ground only on the one kind of stone, *e.g.*, files and saws on a wet stone only, and forks on a dry stone only. In work done on both kinds of stone, some kinds of articles need much more of the dry stone than others do. A table-blade grinder doing all his work himself will spend only a small part of his time, perhaps half an hour or so in a day, in dry grinding. It is lads' work, however, this dry business, one of the first things you put them to; so that if a man has a lad the lad does it, and if the man has more than one trough a young lad will be longer at dry grinding, according to the number of the man's troughs; it may be as much as four hours in a day.

Fans are not used at all by table-blade grinders, as so little of the grinding is dry, and the stone used is of a very hard kind and not so destructive as the soft kinds used for some other things, *e.g.* razors. Indeed, I do not know of any wet grinding in which fans are used. Dry grinders, however, work in the same room with wet grinders, but one of the latter, *e.g.* a file grinder, likes to get as far as he can from one of the former. The dust of his neighbour is no doubt an annoyance to him. I have never myself found much inconvenience from either my own or my neighbours' work, except from the noise made by stove-grate grinding in the same hull, which is very great. No doubt if the windows were close, like those of this sitting room, I should feel great annoyance from the dust.

Table-knife grinding, however, though mostly wet, is less healthy than trades which do not involve grinding. Asthma is the chief complaint from which the workers suffer. I have read Dr. Holland's book, written 20 years ago, so far as it relates to this, and I believe that it would apply equally to the present time. There are however some grinders who keep at work till a good age, but it depends on constitution, habits, &c. Boys, however, should not go to a wheel under 14 years of age. The doctor said that their little lungs were not fit to take in the bad air and dust. I should very much like to see Government take this point up, and forbid boys working in a wheel younger than 14. That is why I so cheerfully give what information I can.

If they began at 14 they would be quite trained as regular workmen by 21. Indeed, as a rule, I always see that those who do not begin very young, say till about 14, do not give half so much trouble, and get on much better with their work. I see no reason why at that age they should not work in wheels the same full time as the men, *i.e.*, at work suitable for them.

The state of many of the wheels as workplaces is very bad, and requires the notice of Government almost more than anything. I have often to travel round to most of them, perhaps 50 in a week, and there are very few in which I have not been. Some are more like dog kennels than anything, and not fit to work in. Their chief faults are that they are too low, have not width or room enough, have not nearly large enough windows, and have no free ventilation. The dust therefore cannot get away, and some of the places are also close in summer, though the draught of the stones makes some current. Many are very cold in winter. The men break out the windows because there is so much dirt from the work upon them, and they have not enough light. It would, however, I think, be better to have no windows at all, so as to let the dust out and air in; or, if there are windows, which are desirable in cold or rough weather, they should be made moveable.

It is quite unnecessary that the floors should be so wet and sloppy as they are, and which has a great deal to do in causing rheumatism. The floors could easily be made so as to let the water run away, and asphalt put down, &c., if the proprietors were only obliged to make the place more commodious. It is, of course must be, dirty work, and the clothes are liable to get wet, but a man can change them, and a boy is chiefly on dry work, glazing, &c.

Another great want is that of light. There would not be half the accidents if all wheels were well lighted by windows in the day time, and particularly at night by gas. It would be a great improvement if this were made compulsory. Some wheels have gas, at others men work with candles. Working by a bad light is bad for the eyes, but men must put up with it because of the expense. A man cannot well have gas and a meter for himself alone, and others might not be willing to share the expense. One man perhaps does not care to work after dark.

The expense of making wheels fit to work in and comfortable would be so small that it could not increase the rent enough to matter to the grinders. It need not increase it at all, for at some of the best arranged and most comfortable wheels the rent is as cheap or cheaper than at the worse. Some of the worst are the small places in which a master has his work done on his own premises.

There is a deal of danger from the machinery, especially with very young boys, and even if they are as much as 12 or 13 when they come. There are some kinds of accident which can never be helped, but most arise from shafts, bands, drums, and cog wheels being not guarded enough; generally from the shafting. Not long ago a file-grinder was killed from being entangled in a part not properly boxed off, and I have known many cases of accident arising from the same cause. A boy is shown at first coming how to throw his band off, but in a day or two he gets to do it by himself. Sometimes it is an apron or some loose part of the dress that catches and draws a person in, and girls have been drawn in in the same way when merely going into the wheel, *e.g.*, with some message.

There are not nearly so many fatal accidents now as formerly from the stones breaking. Using plates, often 18 inches across, to fix them on the bar on which they turn, strengthens them, and is much safer than the common old way of fastening the iron in with wooden wedges, which were apt to swell from the wet. There may be flaws inside the stone which cannot be seen till it is too late and the stone breaks, but a careful looking over and tapping to try by the sound is of course some safeguard. Sometimes there is a doubt, some thinking that a stone looks or sounds all right, so it must be a matter of opinion then.

A needless danger is incurred where the fire-places are set close up to the grinding stones, and I have known fatal accidents from the breaking of stones owing to this. Grinders are in the habit of sitting by the fire at tea or in stoppages of their work, and for some of their work, *e.g.*, setting the blades, they must go up to the hearthstone, there being no other convenience for such work. They are a deal more secure in this repect in waterwheels in the county, as the fires are not so close up. Land is not so dear as in the town.

One of our chief annoyances in the work is getting "mites" into our eyes. Much the worst mites come from the dry stone. Sometimes we buy a lad a pair of spectacles, or put something over the horsing to keep the mites out of the eyes.

The putting of boys by their parents to work so young as many are put, and other faults, are in my opinion chiefly owing to the want of proper education. If children were more educated, the vice and intemperance, which I am sorry to say now prevail too much, would be to a great degree removed.

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40. *William Dyson*, formerly a scissor grinder. When quite a young man I lost the sight of both my eyes by the scissor breaking and piercing one of them. That was 33 years ago, but since the loss of my sight I still spend much of my time in wheels, and am well acquainted with the grinding trade, and have supplied much information on the subject for medical purposes. I do not think that on the whole there has been much improvement in the health of the grinders. It is true that the fan, where used, takes away much of the bad effect of the work, but it is only very partially in use, and the men have now to work longer hours. The regular trade hours at wheels are from 7 till 7, or from 8 till 8, and the men cannot work longer, as the engines only run for that time. But the men work very irregularly, some not more than three days in the week.

The fans are used in some but only in a few places. Taking Sheffield through, not one hull in three has them; most of the fork grinders have not. If there is one which the men can use, they often do not, and if you ask them why they do not they say, "What do "I want with a 'fanny?'" "A short life and a merry "one" is their rule. When it is used, the pipe is put up by the men themselves, at their own cost, and if a man has the thought to put one up he generally has the thought to use it, but it is only the more thoughtful who have. Those who have put them up and used them at their own wheel complain much of the inconvenience which they suffer from the dust, if, as sometimes happens from an accident, &c., they have to go and work at another wheel where there are none. But others do not seem to mind.

Some of the wheels are in a very bad state; killing shambles, I call them.

Taking the whole trade, boys begin grinding in

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the light branches at 10 or 11 years of ages. In the larger factories it is not till older, as these are better conducted and the morals higher. As regards education, I will be bound that, taking the trade as a whole, not one in three can read when they come to the wheel, and I tell you for why I say so; if a man wants to get a boy who can read he can hardly ever find one. More of the men can read, so the boys must pick it up somehow afterwards, not, however, by school, except a little at Sunday schools, to which some masters force them to go. It is chiefly by three or four getting together and trying to read a bit of something like songs or that.

COUNTRY WHEELS.

41. The grinders' wheels worked by water power are on the banks of streams in the neighbourhood of Sheffield. Seven which I visited in the valley of the Porter, a small stream running down to Sheffield, and at which the evidence from No. 45 to No. 54 inclusive was taken, present, as I am informed, a fair sample of the country wheels and their work. On one stream, the Loxley, the wheels, with other large works, were utterly swept away by the great flood of this year (1864). All the seven are small places, the largest having only about 15 troughs, and the smaller much fewer. The work done in them is of several kinds, including saws, files, edge tools, table, shoe, and butcher knife blades, &c. The nature of employment is much the same in all, chiefly wet grinding.

42. On entering the largest wheel the smell of the steel dust from the greater number working together was at once noticeable. The hours of work are usually short, especially in summer, owing to the want of water. During the late dry summer some have only been able to make 13 hours a week. This gives a great advantage, as far as health is concerned, over working in steam wheels. Long work, however, occurs (No. 53).

43. In some of the seven the state of the work place is very defective. In only two of the seven are the large cog wheels at the back, which work the machinery, protected. Almost certain death must result were a grinder thrown upon one of these wheels, as he is liable to be by the bursting of a stone. In one case a man was thus thrown on to the boarding with which the wheel was happily covered. In some cases the bands also are more or less covered with boarding, but in most not. The danger from exposed machinery is greater in wheels worked by water than in those worked by steam, as the amount of power in use is not so well regulated. The amount required depends of course upon the number of grinders at work. When one stops he throws his band off, thus increasing the speed of the other stones. Great speed is dangerous, as it is likely to make the stones fly.

44. The mode of regulating the amount of power is by a shuttle pole, or long hanging handle, by means of which more or less water is admitted to the outside wheel as required. The shuttle pole is in the charge of no responsible person, and it is regulated by mere guess work, according as experience suggests. Serious accidents happen from this not being properly attended to. A grinder showed me his old "horsing," a large seat of wood, which, though fastened down by massive chains, as is usual, had been torn up by the bursting of his stone and flung to the back of the wheel. It was then lying outside as lumber. The boy, whose proper place of work was in the same trough in a line behind him, had providentially left his work for a few minutes when the accident happened.

45 *Benjamin Wildgoose*, shoe knife grinder in Shepherd's wheel.—I am sure something ought to be done for grinders. They dont oft live long. One is an old man at 40. The places are so cold, and the work makes such a draught, that it is very dangerous when you have been sweating. I am pretty well myself, but I have taken care of myself. I began at 9 years old, but I gi'ed over a bit and went to school, and did not begin fully till 12; I am now 44. There are some terrible grinding places in the town.

I have had the stone fly with me once or twice. It would very likely throw you into the cogwheels there (unprotected); with all the machinery it is very dangerous working at night as we have only candles. I scarcely ever work after dark myself.

46. *Samuel Hind*, grinder at same wheel.—Began when I was 10 years old, am now 54. Once was caught by my apron on the axle, and thrown down. Have had five or six stones break in my life, but have had very good luck, and was never much hurt.

Call 10 hours a long day's work. Eight hours a day is quite enough for any grinder to work. It is very injurious to health.

47. *Thomas Redfern*, grinder in Over Endcliffe wheel.—In about 18 years I have had 10 stones break under me, two of them on two days running. Once I was thrown right up to the top of the wheel and was much shaken by the fall. About a year ago my horsing was thrown by the stone flying right to back of the wheel, and I was thrown forward and struggling on the top of the stone. The boy behind me there (No. 48) was away, but would have been at his work in 10 minutes. If he had been there he might have been killed. I have never been lamed, but have had bad shakes, cuts, and bruises, and lost as much as a week's work by such an accident. It shakes you very much. I have had a cut six inches long across my back and others on my legs in this way. A man who was thrown against the boarding over the cog wheels at a wheel below (*See* a. No. 50) was at the dispensary 9 or 10 weeks for it, and had scarcely returned to work when his stone flew again. But he was not careful, and was working by himself, and let the wheel go too fast.

In steam mills too the machinery sometimes goes too fast, which is dangerous, as stones will stand a certain pace but not beyond.

Till I was a man I did not have any stones break, as boys do not work so much at the big stones, but I had been fixed much the same as my lad there when my horsing was thrown back, and had, I should think, five or six narrow escapes. Once a like accident happened when I should have been at my place behind in a few seconds. Stones fly backwards and forwards and all ways. We try the stones by looking and tapping to see if they are safe, but cannot always tell.

48. *Henry Birkin*, age 13, in same wheel.—Glaze and grind on a dry stone; grind dry for about an hour a day. Never work after dark. The wheel does not stop at dinner time; we only stop work as long as we can get us dinner, about a quarter of an hour. Can read a little.

49. *George Redfern*, grinder in same wheel.—Began at the wheel here at 10 years old; it was too young. When I was about grown up I went to grind for 18 months in Sheffield and felt worse directly. The smells were bad there, and I got no out-door exercise. Felt generally ill and weak, and found difficulty in breathing. Lately I came out here again, and felt better again at once. Am sure that I can earn more and be better out here.

When I was 9 years old I went to work at cutting notches in sickles in a small factory at Norton, a village near Sheffield.

[Looks delicate, with a pale flush in his cheeks.]

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50. *John Brigg*, grinder at the Nether Endcliffe wheel.—No water wheel is safe. If the shuttle pole is not attended to properly it puts too much power on. The pole here was marked with a scale to show how much to raise or drop it for each band that is put on or off, but we do not attend to the marks, we do it by the feel, and allow so much (about an inch) for each band. About 18 months ago William Calton, a grinder here, was thrown by his stone bursting on to the boarding over the cog wheels at the back, and was two or three months at the infirmary. Half of the stone flew up to the top of the wall here in front, half behind, and the horsing out on one side.

51. *Samuel Warner*, age 19, grinder at Lescar wheel.—Have been a grinder 10 years. Dare say I was under 9 when I began it; was working under father, and in Sheffield.

52. *Joseph Broadhead*, age 10, at Lover's wheel.—Am glazing saws. Work with father, usually 7 or 8 hours a day. Always stand at the side (of the glazer) like this. There is no fan.

> [Though I stood beside the boy, and rather behind, sharp particles kept flying into my face.]

53. *Walter Ibbotson*, age 16, fork grinder at Ibbotson's wheel.—Began when 14. Work 10 hours a day usually, many times 15. Am now hoeing the stone to make it cut. Do it for about 5 minutes in each hour. The mites get in my eyes and hurt them. We get a lancet and some one gets them out.

> [Better grown than usual amongst grinders; probably, as my conductor informed me, because he had a steady father, and did not begin work so young.]

54. At Spur wheel, the largest in the Porter valley, the cog wheels, though unprotected, were in a recess and more out of reach. A youth of 17, in answer to a question whether the work suited his health, said—"Oh yes, I have never been ill *yet*."

RAGG'S WHEEL, ECCLESFIELD.

55. This also is a country wheel, a few miles from Sheffield in a different direction. Water power is used when obtainable, but when it is not, work is continued by means of steam power, which has been lately provided for the purpose. The wheel is occupied only by fork grinders, of whom about half, viz. four, are boys between the ages of 11 and 14, of whom the eldest had been at the work for three years and the youngest nearly a year. Though the building is now occupied by only half the number of workers that it had formerly, the air is full of the particles given off in grinding and glazing, as shown by the strong smell, even on my first entering the doorway. "You will be able to taste this dust when "you get home, and to-morrow too, though there is very little stirring now to what there has been," said one of the grinders to me. On weighing some forks of the average kind, it appeared that 11 unground slightly overweighed 14 glazed or finished.

56. The defective state of the work place and want of sanitary arrangements are described by one of the grinders (No. 58). The light is very imperfect, even by day, and more so after dark, at both of which times I was in the wheel. Each grinder places beside him a dip candle in a rough wooden box, open at one side and the top, which serves to screen off the draught. The work, however, needs close watching, and imperfect light probably brings the face closer to the wheel, and therefore to the dust, than would be otherwise necessary.

57. While I was in the wheel a grinder complained that the pace was too great, and gave directions to have it slackened, for fear the stones might fly. A serious accident happened here from this cause, the stone flying and dashing in the mouth of a grinder.

58. — *Tingle*,* fork maker and grinder.—I began the trade at about 13, but my father would not let me work at it long together on account of its bad effect on the health. He was in the fork trade, and carried it on, on and off, till he was 40 or 50, but it is not many that can so long. It is very pernicious work, and it is reckoned that our average age, if we work at it regularly, is about 28. No man, if he considers his health, should work at it more than 6 or 8 hours a day, but the less time a man sticks at it the better. I am now only 37, but I only come down to the wheel about two hours a day, and go to shop the rest of my time and work at the making, because I find the wheel so injurious to my health. When I feel a bit sickly at grinding I know what it is, and keep to the shop till I get shut of it. I tell the boy who works for me about this dust, but he thinks nothing of it, though he is a clever, quick boy. We reckon to eat all the fat we can in the morning, such as bacon, &c. This dust here if mixed with a little water will set as hard as cement, and you can fancy what it must be inside a man. What comes from the stone consists of the grit of that and the steel, and what comes from the glazing wheel has the emery and the glue with which the emery is fixed on the leather. The glue being so sticky makes it more pernicious. The dust which comes from "metal" as we call it, *i. e.* iron, of which the common cast-iron forks are made, is more pernicious than the fine steel. It is a deal softer and comes off more easily. I have seen men's shirt sleeves all yellow and rotted away from the dust which settles on them. I believe that, taking a fair average of the different kinds and qualities of forks, they lose a fourth of their weight in grinding and glazing. Much, however, depends on the care with which the rough fork is made. We here, who make and grind our own, forge them as clean as we can, so that there may be as little as possible to grind off, but often this is not attended to when they are ground by others.

A fork grinder has just gone into the Sheffield Infirmary with a leg broken by an accident. He was so bad with the grinders' disease that the doctors said he could not live till New Year's Day, the stuff had got so settled into his stomach and air pipes. They gave him something to vomit it up and it came up in big lumps as hard as iron. If he gets better it will be the breaking his leg that saved his life. He began grinding at 10 and had done nothing else all the time; he is now 38.

There are no fixed hours in the trade. We are all manufacturers ourselves, and work as we please.

Boys begin the trade generally at, I should say, about 12 years old. If I were to bring up my own children to it I should put them to it a little to learn at about 10, just to get their fingers in, but not to work. To make a good worker a boy should begin by 13; one who did not begin till he was 16, and his fingers were stiff, would always be a slow worker. I should think that there were as many as a couple of hundred fork-grinders in the trade, about a quarter of the number boys. Most of the work is done in Sheffield, but some in country places like this.

This wheel is a low, bad place; a man would not live two years working here every day for 12 hours.

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* The witnesses of this name are members of two or three different families, J.E.W.

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He would be clean blown up. There is no ventilation but the windows in front. They never had glass in them in my recollection. In winter it is very bad. The wind blows all the dust right back in our faces. There is no fan. Landlords and owners of wheels ought to put them down for us. It is a very trifling expense. One might be put and fitted for all the troughs in here for 5*l*. They are put in some places, but some boys are put to grind in little chambers as dusty as possible.

59. *Charles Tingle*, age 21, fork-grinder.—Used to file insides of forks when about 8 or 9 and began in the wheel at 13. Am not very well, but am better than some; it suits nobody's health. It's not very warm in here no time, not in summer, and in winter it is very cold indeed. A wind always comes off these wheels behind us. We reckon to work from 6 to 6 here. At a wheel at Grimesthorpe, a village near here, they work the same hours, but a shorter day on Monday.

There ought to be a fan. If there were, we should have to pay for it. They are all prices, from 30*s*. upwards. At some wheels the landlords put them up and charge for them with the trough. The rent for my trough, with places for myself and a boy, is 3*s*. 3*d*. a week, and we find our own candles, &c.

All this dust in my trough has come since last Saturday. People fetch it away every week to mix with lime for mortar, as it sets so hard. Had this stone new five weeks ago, but it is worn so low that I shall want a new one on Saturday. Have to chip it several times a day to make it bite.

60. *John Brook Greaves*, age 14, glazer.—Was apprenticed at 12 for 9 years. We are apprenticed to find you clothes and something to eat; that's all. Always have plenty of good meat to us dinner. Master is middling kind, and does not hit me except sometimes when the work is not done very well. Do not get any money, but sometimes master gives me a chance of "addling" (handling?), *i.e.* earning something for myself by doing more work. Our regular time for working is now from 7 a.m till 7 p.m., and on Friday from 6 a.m. till 8 p.m., and have an hour for dinner, but no other meal time. Have to get breakfast as sharp as we can, *i.e.* in about 10 minutes. The other three boys work the same time as I do; two of them work under their fathers. There have been as many as seven boys in here at a time. There are 12 troughs. At a wheel half a mile off there are three boys, one apprentice to a fork-grinder and two working with their fathers as file-grinders. There are three fannies there. Only three men work in here regularly. We use water in winter and steam in summer, so that the wheel is always going except at dinner. It is very cold in winter, but we can manage to work when we are used to it. There is a fire.

Am well, and can get my breath easy. The dust makes no difference to us. It is not very heavy work, but your back is sure to ache when you do much work. Never had a cough at wheel before this last week, when I have had a cold. Spit a good deal. Suppose that is to get the stuff out. (*Spits repeatedly though away from his work*). The dust gets into my hair, and I have to wash it out nearly every night; a deal comes out, and you can see it in the water, it is so muddy. They sparkle to us eyes very bad; that's the worst thing there is in it. It pains a deal, and I have had to leave off working many a time for it. We can take one another's "mites" out of our eyes with a sharp pin, and soon cure them with putting in sugar and milk and so. It is never abune a night before they are better. If we are careless we may get caught in the band; it has pulled my shirt sleeve off, but not hurt me or any one here.

Go to school on Sundays, and have been on workdays and all. Am not a very good writer, but can read pretty well, *e.g.* a newspaper. Would be a very good summer when I went to school, but it is so long since that I do not remember the names of any.

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61. *Keziah Bouldin*.—My husband was apprenticed to fork-grinding when about 14, and worked at it and at fork-making for many years. When about 27 he had to give it up owing to the scarcity of work, but after three or four years took to grinding again. In about a year or so he got the grinders' disease so bad that he was at home six months with it. It was thought that he would die, and his life was only saved by the greatest care, and the doctor said that he must never grind again; but he is very weak and never will be right no more. Another grinder at the same wheel, Ragg's, who was ill at the same time, did die. When it once gets fair hold of them nowt can save them.

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62. The next witness works at home with a girl of 15, a relation, in a scullery, filing the insides of forks. She also cuts the forks in a shop near with a fly or press to separate the prongs after they have been forged and stamped into a rough shape by men. The forks are then brought into the house and "opened out," by heating in the fire of the living room, to enable the file to work between the prongs. The filing is laborious, and requires a constrained and fixed leaning position.

63 (1). *Ann Tingle*, age 20.—Have filed insides at home here since I was 9 years old. Had practised many a time before I began regular work, perhaps since I was about 7. Have worked all the time about the same hours, viz. from about 7 a.m. till 8 p.m., stopping perhaps two hours altogether for meals and doing things in the house, and on Thursdays and Fridays generally work till 9 and 9½ p.m., and sometimes begin early on Saturday, *e.g.* at 5, to finish the work for taking in to Sheffield. Take in on Tuesdays, and Thursdays too sometimes. Have worked while 12 at night, but never longer; but my two sisters, who used to do the same work here, have worked all night, I believe. There are five families round here who do fork-filing in the same way; two of the daughters in each work at it; only two of them are 18 and the youngest 9 or 10. There is another part of the village where girls file forks. All work about the same hours as I do, I believe; but some till 10 two or three nights a week. Since I have been at work there have been no fixed hours of work, but before that people were obliged to work only for fixed hours, from 6 to 6, I think; this was because there was a union then which fixed the hours.

Filing is very hard work, and we could not do it without this leathern band round our wrist to help hold the file. It tires my wrist and shoulder, and must tire the other girls the same. They can't help. Sometimes too it gives me pain in the front of my left side, as we have to lean over, not right forward, but side-a-way, so (*showing*). I generally have to cut in the shop about 4 hours every day. It does not tire me so much as filing, but it is rather awkward, because I have to stretch myself so to reach the fly, and brings a pain in my side. The pain may be partly because I catch cold going from the warm house to work in shop where there are so many draughts, and I have just got a severe cold in going to Sheffield to sell the forks. We do not have to carry them all the way, but only about the town from where the carrier leaves them, from one street to another to the different shops. We may have four gross, and a gross weighs from 14 lbs. to 16 lbs., according to the size of the forks. We carry part, however, to Sheffield ourselves, some two gross, but I can't carry more than one gross so far. Some girls only work for hire, and these do not have to carry the forks to sell as we do. We find the steel and pay men so much a gross for forging. A girl of 18 working for hire may make 7*s*. or 8*s*. a week by fork-filing, and one of 12 or 13, 5*s*. or 6*s*.

File-cutting is the chief work in the village, and

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is done by men, women, girls, and boys, and all. They work just as they think proper. I think it is not a healthy business. They don't reckon to live to a great age if they work at it regularly. Some cannot use their left thumb. Two young men next door cannot. This is from the pressure of the chisel, and I dare say that the lead on which they cut is injurious to health.

63(2). *Sarah Ann Tingle*, age 9.—Live in a house near. File forks at home all the afternoon, not in the morning, because I have a little baby. Begin at 2 p.m. and give over at 10, generally about 9; may give over afore 9, but seldom; sometimes at 8. My sister, about 14, begins about 7 a.m. and gives over when I do.

Was never at any school but on Sunday.

[Dress torn, and shoulder left bare. Healthy looking.]

NEEDLE FACTORIES AT HATHERSAGE.

64. This is a retired country village in Derbyshire, 10 or 11 miles from Sheffield, but contains three factories. The principal manufacture carried on in them is that of needles and hackle pins, though one of the factories includes also the making of umbrella furniture or iron work. Hackle pins are the sharp steel wires used for combing flax, but, so far as the nature of the employment is concerned, there is no important difference between the manufacture of them and of needles. The chief processes are drawing wire to the required thickness, hardening and tempering, and straightening and cutting it into lengths, and, lastly, grinding the points, and scouring or polishing.

65. The most important of these, as regards health and the precautions needed, is the grinding. The grinding is all done on a dry stone, which revolves at a very great speed. A number of wires are held in the hand and ground at the same time, and the quantity of sparks and dust thrown off is very great. On approaching the principal manufactory, while still at a distance of 70 or 80 yards, I could smell the steel dust, and afterwards at this and the other two factories noticed it rising and floating away like a thin cloud of smoke or steam from the places at which it is discharged from the buildings. Outside the principal manufactory was a large mound of considerable extent and height formed by the accumulation of only two years.

66. The arrangements made in all the three factories to guard the workers from the deadly effects of this dust are very good, and deserve notice. The top of the stone is covered with a damp cloth, wetted fresh every morning, leaving only the few inches of the stone which the grinders requires uncovered. At the back of the stone a wide-mouthed pipe at the top carries off a large portion of the dust. Another pipe at the bottom carries off a further portion which has escaped the top pipe. The dust is sucked into these pipes by a powerful fan, and blown out from them by another through an underground flue leading outside the building.

67. This concentration, however, of the dust at the outlets renders some further arrangement necessary to protect persons outside, or neighbours, from its effects. The prevailing wind carries the dust from one factory on to a workshop and cottage close by. The Messrs. Cook contemplate making a reservoir of water at the outlet of their flues, which they believe will to a great degree prevent the further escape of the dust.

68. The Messrs. Cook have also provided flues to carry off the dust caused in glazing hackle pins, and this appears highly necessary.

69. It should, however, be added that, in Hathersage at least, the employment of grinding is one which affects scarcely any but men, and only a limited number of these, the work requiring great skill, and an apprentice rarely beginning till the age of at least 15. The effect on health is stated to be much less if they do not begin till they are grown up. For, notwithstanding all the care, some dust still escapes, and, in the opinion of the grinders, is injurious to health.

70. The great pace of the stones is a source of danger. In two of the factories I saw broken stones, which lately had burst and flown through the roof, happily doing no further injury.

* MESSRS. COOK AND CO.'S, NEEDLE, HACKLE PIN, AND UMBRELLA IRON MANUFACTURERS, HATHERSAGE.

71. *George Burrows*, needle pointer.—Began this work at 14 years old. Worked for 14 or 15 years without a fan, and for the last 20 with it. No one would believe the difference it makes; without it I always felt sick and a tickling in my throat, and as if I wanted to throw up something; then went and got some stuff to help it, and would throw up a deal of dirt. It is a very good thing for you to be sick. It is a very good thing too to take exercise, it gets the dust and phlegm out. There is still some dust which we breathe though with a fan.

["A chap at this work in Sheffield," said another grinder, "lately threw up a piece "of black from the steel dust as big as "the end of your thumb."]

72. *Maria Lansley*, age 9.—Use a hand-fly for shaping umbrella ribs. My hours are from 6 a.m. till 7 p.m., with an hour for dinner, and breakfast and tea half an hour each. Have stopped at work till 8 p.m. and about twice till 9, and sometimes leave at 6 p.m. We don't ever work in the dinner hour. Get 2*s*. 6*d*. a week. Have to hold up my arm so high always to work the fly; it makes it ache sometimes, and makes my right side hurt too.

73. *Thomas Scholefield*, age 11.—At work here two years. Head and box the wire in a shop where it is hardened; my sister here, aged 13, does the same. Work from 6 a.m. till 7 p.m., sometimes till 7½, and it has been till 9. Sometimes stop to work in dinner time. Get 3*s*. a-week.

MESSRS. COCKER AND SON'S, HACKLE PIN MANUFACTURERS, HATHERSAGE.

74. *Mr. Joseph Robert Cocker*.—Any regulation of our hours not exceeding the factory limitations would make no difference to our business. We employ no females and few young boys now. When we made needles, which we do not now, we had a number of both. We have some boys engaged in

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* A statement made by Mr. Cook, received back from him too late to be inserted in this part of the evidence, is printed in the end. (*Vide* No. 296.)—J.E.W.

Metal Manufactures.

Sheffield District.

Grinders.

Mr. J. E. White.

a.

scouring wire and one in cutting it. We generally let boys become accustomed to handling the wire in other ways before they are set to pointing; that is usually at about the age of 15.

A brother of mine invented the fans now used for pointers. They are now used by Government for different purposes, such as pumping air into ships. It is a very considerable expense to us. The one which we use for our 10 pointers cost, with the apparatus complete, 100*l.*, and besides this it takes three-horse power every day to work it. It drives the air through a tube of some inches square, at the rate of six miles per minute. I never calculated how much dust it carries off in a day, but 20 lbs. weight of steel with the average kind of work would be ground down to 15 lbs., and in some kinds to 14 lbs. The benefit to health is very marked. The men used to die at the age of from 32 to 48, and the oldest grinder to be found in the trade anywhere, I believe, was 40; now they are, I should say, decidedly as healthy as men in any indoor employment, *i.e.*, those of them who began work since the fans were in use. Some others, who began before, are still liable to be affected by the work. The men themselves well know the value of the fan, and if it will not work, as through a strap being off or anything, they would not keep on two minutes, and I could not persuade them. Our grinders only work six hours a day.

MESSRS. CHILD AND CO'S., HACKLE PIN MANUFACTURERS, HATHERSAGE.

75. *Mr. Marsden*, one of the firm.—Our pointers only work from 8 till 4, less the dinner hour. We use the fan, and the only unhealthiness of the work arises from the intemperance of the men. When they are intemperate it makes fearful work with them.

The great speed at which the stones must go for this work is a source of danger. Lately a stone burst and flew out through the roof. I do not know the exact speed of the stones, but it must be several thousand revolutions per minute. We use water power, but it is so arranged that a child could regulate it. There is an apparatus for testing the pace; if it makes more than a certain number of clacks in a given time it is known that the power is too great. As soon as ever one man throws his band off the others go and regulate the power accordingly.

76. Dr. Hall, in his treatise already quoted, also gives his medical notes of a few late cases of the Sheffield grinders' disease, out of the great number that have come under his treatment in his private and also his dispensary practice. Short extracts from two or three of these cases will be useful. They show that the causes of the disease are by no means confined to dry grinding alone.

77. *Case* I., *A. D.*—Pen and pocket blade grinder. "Has always worked on a wet stone," but "razor "grinders have worked in the same hull with him." "There is no fannie in my room, nor about our "wheel." "It (hæmoptysis) has frequently recurred, "and he is always attacked with it after racing a "stone." "The chest measures 30 inches and ex-"pands only to 30¼ inches."

Case II., *J. G.*, aged 31, scissor grinder (dry).—"First went into the wheel when 9 years old. He "has had attacks of shortness of breath at intervals "for years, but got on very fairly till about a year "ago, when he was seized with profuse hæmoptysis."

Case III., *J. S.*, aged 44, file grinder (wet).—"Has several times had hæmoptysis." "With the "exception of the little bits of stone and steel dust, "there was nothing to distinguish the expectoration "in this case from what is observed in the flocculent "sputa of an ordinary case of phthisis."

Case IV., *H. L.*, aged 53, razor grinder (dry).—"He is about 5 feet 4 inches. The chest measures "32 inches, and expands to 32¾ inches." "Died three "months after admission to the dispensary."

Case V., *H. W.*, aged 28, pen-blade grinder (wet).—"Complains of shortness of breath, cough, night "sweats, and loss of flesh."

Case VI., *F. C.*, aged 19, a razor grinder (dry).—"The disease had made considerable progress; he "had been in the wheel from an early age." "He "died two months after admission."

Case VII., *J. H.*, aged 21, a table-blade grinder (for the most part wet).—"He stands 5 feet 3½ inches, "and weighs 8 stone 7 lbs." "His father, a table-"blade grinder, died of the grinders' disease at 39, and "his grandfathers, on both sides, died of the grinders' "complaint. Does not think consumption was ever "in his family." "He works mostly wet; the bolsters of the table knives are ground dry. He suffers "very much from dust when they race the stones, "which fills the hull with dust."

Steel.

STEEL AND OTHER MANUFACTURES.

MESSRS. T. FIRTH AND SON'S, STEEL MANUFACTURERS, SAVILLE STREET EAST.

78. *Mr. Charles Henry Firth.*—We convert and melt steel, and manufacture it into ordnance, shot, and for all general purposes. We employ somewhere about 1,200 persons in our works here.

Most of the machinery runs night and day, and there are relays of men and boys on the usual system. The machinery stops half an hour for breakfast and an hour for dinner. The meals are taken punctually. The men arrange the "heats" so as to suit for this. About 22 or 23 boys work in the cellars beneath the melting furnaces. Their day consists of three rounds of melting.

The boys are employed by the men, who often engage them much too young. We fix a price which we can pay the man for so much work, and he gets it done as cheap as he can. Sometimes they get some so young that we think it a shame, and are obliged to send the boys away. This working of very young boys is especially common in the crinoline steel rolling, and the trade has been very much cut up and spoiled by it. The crinoline rolling here only goes on by day, but sometimes a quarter of a day or so's overtime is made.

Besides these works we have iron and puddled steel works near Chesterfield, with the same system of day and night work in alternate weeks as here. The night sets have the advantage of working only five nights instead of six days.

We have also a file manufactory. That has only day-work, viz., from 7 till 7, with meals.

I think that it would be a very good thing if boys were not allowed to go to work so young as they do. In light work, such as crinoline rolling, 12 would be a right age for them to begin. After staying a year or two at work of that kind, they could then well go on to heavier work.

79. *George William Ross*, age 12.—Shove on at cold rolling, *i.e.*, of crinoline steel. Sometimes make one quarter over in a-day, sometimes two, *i.e.* half a-day, or 5 hours; but have not done so here more than once in a week. Sometimes take a night turn besides my day turn if I am wanted.

Have done the same kind of work at two other places before. At the first, where I went when I was 9 years old, and stayed a year, I once worked for three nights running as well as the days. We should have gone so, *i.e.* worked nights as well as days, to the end of the week, only the engine broke down. The nights were Tuesday, Wednesday, and Thursday. Was only allowed to sleep of dinner hours. I should

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Steel.

Mr. J. E. White.

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tired when we had worked through a day and a ight and got to the second day, and then I went to eep at the dinner hour, and should not be tired gain till we gi'en over. Had a dinner hour by ight as well as by day. Three other boys worked e nights and days both when I did, one was 13, e 14, and one 15. Could not help working so. Vas obliged to. Got the same pay for night as for y, no more. Earn 4*s.* 6*d.* a-week now.

Am I old enough to work think ye? I should ke to go to school a bit longer instead of working. Q. But you like work, don't you?)—No. I often et two or three cuts on my hand from the metal. an read and write. Father sets me to it sometimes the evening, and if I don't feel tired I can do as uch as I've a mind. Some days I feel so tired I an do nowt at all, and some days I am not at all red. It is because some days we have worked arder than others. There is night school sometimes, nd I always go to it when it's open, and I go to benezer on Sunday afternoon. I should like to go school again a bit. Do ye think I can?

> [A remarkably intelligent boy and of pleasing manners; one who, could he have had the schooling which he wishes for, would probably have turned it to best account and advanced himself in life. His appeals to me to be allowed to go to school, which he repeated in different ways, could not but be very painful.]

80. *William Ross*, steel-roller.—Father of last witess. I wish I could have let my boy stay at school bit, instead of taking him to work, but I could not elp it. It is true that he did work three nights unning, besides the days, as he has told you. I had een very short of work, as I had only lately come ere from Birmingham, where I rolled steel in the ame way as here in two of the largest steel-pen actories.

> [An intelligent man, and even superior looking. His keeping his child at work so hard was no doubt from a feeling of necessity.]

81. *William Henry Ray*, age 10.—Shove on at the rollers. Don't know how old I am, (an older brother is 11. J. E. W.), or how long I have been here; think it is a year. (Six months, I was told. J. E. W.) Stay at work sometimes till 8 at night, and sometimes till 10. Have half an hour for breakfast and an hour for dinner. Get 4*s.* 6*d.* a week.

Can read a-b ab. Go every Sunday to a school which has been opened in Brown's works (Atlas Iron Works).

82. *Henry Stow*, age 14.—Take out hot metal at the rollers. Work days one week, and nights another, from 6 till 5½ always. Sometimes get burned with the hot metal. (Shows large scar on arm.) Went to work at shears at a cutlery manufactory when going 7 years old.

Can read a bit, but not write at all. Don't know of London, or Queen Victoria, or if she is a woman, or takes care of the country.

83. *James Oxley*, age 11. Cellar boy, and make lids. My proper day is from 6 a.m. till 7 p.m. On Monday I come at 4 a.m. one week and 6 the other, as both the yards cannot start at once. On Saturdays we come at 2 a.m. or 3 and give over at 3 or 4 p.m. Have no regular times for meals, but have plenty of time to spare in the day,—four or five hours. In part of that I have to carry out the waste from the furnaces, go errands for the men, raise the pots for them from below if they stick in the furnace, &c. It makes me sweat when I am carrying waste, or when I am busy in the cellar doing anything. Have been at this work here better than two years. Earn 4*s.* a week. The man gets all the money and pays those that work for him. Father puts some of it in the bank for me; I don't know how much.

Can tell some of the letters, not all. Go to church in a morning.

MESSRS. NAYLOR, VICKERS AND CO.'S, STEEL MANUFACTURERS, MILLSANDS AND WADSLEY BRIDGE FORGES.

84. *Messrs. Naylor and Vickers.*—We carry on he general steel manufacture, including forgings and astings in steel, and the manufacture of bars, sheets, &c. We employ between 600 and 700 persons, and re now building larger works near Sheffield, which over about 20 acres of ground, our present works eing too small for our business.

We prefer not to employ lads under 14, but to blige our workmen we sometimes take them younger, hough not younger than 11. Only 10 per cent. or so f all the persons employed, who are all men and boys, re under the age of 18. The boys work chiefly in he rolling mills at the back of the rollers, others at he forges, carrying away bars, and others, about 15, ncluding five of the youngest, in the cellars of the melting furnaces. Their work is to watch when the pots un, which is the way in which boys are employed enerally in the town in steel melting. They do ot suffer from the heat. The temperature is probably from 80° to 90°. The remainder are engaged n moulding, pot work, lathes, and turning, or in the warehouse as errand boys, &c., and two or three at oiner's and mason's work. At the forges and in the rolling mills the hands work day and night in relays, but all other parts of the work are day work only, *i.e.*, from 6 a.m. to 6 p.m. In the forge the hours are from 12 till 12. Some of the hands always work in the nights without any alternation of day and night work. These arrangements of hours are made by the men according to their own choice. We do not find any difference in the health or work of those who work regularly by night and those who work by day, and probably people can sleep better if they have the same period of rest than if it is changed. The melters have to do three rounds of melting in a day. If it takes more than the regular time, they have to stay to finish, but they often get away in less than the 12 hours. We do not like the men to be actually engaged in work in any branch for more than 10 hours. It is not so good for them, and not economical to the employers. About 20 of the boys under the age of 18 work in the night sets. About a dozen of the boys are in the employment of the men, not of us; but it is understood that they are equally under our control, and it is the duty of the foreman to look after them. We could not well do without lads under 18 working by night. The objection would be the increase in the cost of production. But if the age were fixed a year or two lower there would probably be no difficulty. It could be arranged by merely putting the younger in the day sets. Skilled hands and the heads in every department are difficult to get, but of lads we could get any number. Boys under 13 get perhaps from 5*s.* to 6*s.* a week, and from 14 to 16 perhaps 7*s.*, though in work at which boys are apprenticed they get rather more. A smartish lad of 18 or 20 at the rollers will get 3*s.* a day. It is after the age of 16 that a limitation of boys' work would begin to make a difficulty as to wages. We pay one price to all below that age, according to their work, without regard to age. But from the small proportion of boys that we employ the subject (*i.e.* of restrictions on night-work by boys) is of little importance or interest to us.

We have the machinery as well guarded as it can be, so as not to interfere with the work. We have had only one fatal accident in 20 years.

The holidays at Christmas are less in the steel trade than in others, and do not average a week. Besides this there are two days at the two fairs, and a day at Whitsuntide. The holiday given, however, depends upon the state of trade.

85. *John Holmes*, age 13.—Heater at a forge. Work from 6 till 6, most on days (not nights). Never

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stay longer. Have half an hour for breakfast, and an hour for dinner at 12.

Before I was here, was a year at some large steel and tool works in Saville Street. There I sometimes worked nights as well as days ; on Fridays only. Went home to tea for half an hour ; then came back to work, and went home again at 12 at night for an hour, and worked on sometimes till 4 a.m., and sometimes gi'en over at 1 a.m. Other nights worked always till 8 or 9 p.m. except Mondays. Think that Mondays were the only nights that I gave over at 6, except when there was nowt to do, and they wanted to make another day. There I worked as apprentice to a man at a tilting hammer, "heating in," "straightening," and "taking under."

He used to reckon to buy me clothes and give me meat, but he was a drunken man and would not buy me clothes, so I left, and now get 9*s.* a week here. He used to swear at me and punch me with his foot if I didn't do a thing he told me, or if the heats were cold when he came back from the public. Here the man don't beat me because I am not "bun" (bound) to him. They can't beat you unless you're "bun," but then they can. That burn in my face was done by the man here with the "heat," but he couldn't help it. Don't find it hot; have always been used to a hot job. At my former place it was a leetle hot ; it was a leetle job.

Know most of the letters. Had to go to day school till father began to be bad, and go always on Sunday and to church. There is no night-school about our house now, but there is at winter when it's frosty and there's snow on the ground, and I go then and pay 6*d.* a week. (Is asked of Queen Victoria). Have heerd the name on it ; can't tell what it means. She finds 'em money. The Bible is the Holy Bible. Have not heard of the Testament, Gospel, Adam, or Jesus Christ. An angel is an image.

86. *William Amos Blithe*, age 13.—Am learning to be a mason in the works. Father is a master over the bricklayers. Was at school till 12 years old, and paid 6*d.* a week. Did sums as far as practice and compound rule of three. Read the Bible and History of England. Read about Henry 8th and George 3rd. Henry 8th had six wives.

87. *Henry Gregory*, age 13.—Cellar boy. My proper day's work is from 6 till 6, but it all depends. Sometimes have done by 4½ or 4 p.m. On Saturday come early, *i.e.*, at 3 a.m. and 12 at night (Friday) and so, and then get done by about 11½ a.m. Go home to my meals. Get 4*s.* a week.

Can read (scarcely). Can write better than I can read.

Steel and Iron.

MESSRS. JOHN BROWN AND CO.'S, STEEL AND IRON WORKS, SAVILLE STREET EAST.

88. These works, with the adjoining works of the Messrs. C. Cammell and Co., which are of like kind, are on a very large scale indeed, the two firms employing together towards 6,000 persons ; a small portion of whom, however, in each case are employed in works in the country at a distance from the head establishment.

89. The work includes puddling, forging, rolling, casting, and other processes. Some of the boys are exposed to considerable heat, especially some of the youngest. One, aged 10, a "holder up," stands a few feet in front of the furnance, and draws up the door when the hot metal is drawn out. The flakes of hot metal, which fly many yards round from the shingler's hammer, as well as hot metal or refuse lying about, require care. I noticed screens to catch such sparks put up near one hammer, and a man in another part with metal greaves to protect his legs. Masses of red hot metal, too heavy to be carried, are wheeled about, sometimes by boys. Just after my visit here a bad accident happened to a man at some works in the neighbourhood, from a man slipping while wheeling a red hot railway wheel, which thus fell and lay on him, he, of course, being powerless to move it. Boys also drag red hot metal from the rollers ; and some are "cellar boys."

90. It was stated that the steel rolling, which is only day work, is sometimes prolonged till 10 p.m., or begins an hour or two earlier in the morning.

91. *Mr. J. Ellis*, one of the firm.—Our work includes the manufacture of steel and iron and heavy steel and iron goods of most kinds. We roll large quantities of armour plate, and also make railway springs and rails, shot, gun forgings, &c. We employ about 3,000 men and boys, and our works here cover 15 acres of ground, besides other works which we have in the country. Part of the work, viz., iron and the heavier kind of steel work, goes on day and night by means of relays working 12 hours each, and part, such as other steel work, spring making, &c., by day only. In the heavy steel work only one or two boys are employed to a score or two men. The day is from 6 a.m. to 6 p.m., and the night from 6 p.m. to 6 a.m. In the day work there are regular intervals for meals, but in the iron working branches there is no certainty as to when meals can be taken. Owing however to the nature of the work, there are several intervals of rest, though seldom more than half an hour at a time. Meals are taken in some of these intervals and work begun again at once if it is ready. This necessarily must be the usual practice in iron works. The meals however can be got always within, say half, generally within a quarter of an hour of the proper times, viz., about 8½ and 1.

Most of the boys are in the employment of the men, *i.e.*, in those departments in which the work is done by the piece, which is in nearly all. Where the men are paid by the day, *e.g.*, in the steel and spring rolling, the boys are in our own employment. There is nothing in the nature of the work to occasion this distinction, it is quite accidental.

It is not at all necessary for us to have boys under the age of 12. It might be well to exclude boys under this age altogether. It would be better for them, and would make scarcely any difference in cost to us. We have upwards of 500 boys under the age of 18 in our employment, and of these about 170, or a third, are under the age of 13.

I do not think that it would be very objectionable to require that no person under the age of 18 should under any circumstances work more than 12 hours in the 24. But we do not think that any line could be drawn over the age of 12 at which boys could be dispensed with for night work. But we would sooner be prevented from employing boys under the age of 13, or even as high as 14, at all, than not be allowed to employ boys, that we do have, at night. Those boys who work in the day sets must take their turn in the night sets also, because men could not work in the night sets only ; it would ruin their health. In summer, however, they might perhaps have the best of it, as the heat in the day then is very great. We insist on their changing their set week by week. We have sometimes made exceptions, letting men undertake the night turn of others who were being hurt by it, but we have always found these men giving way in health from the night work without change. We think, however, that night work in alternate weeks is no harm. We find the men who do it as well as the others who do other work only by day. We like also, for convenience of the workers, to keep the same sets working together, as the food of a family can then be sent at the same time, and altogether it suits their home arrangements better.

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a.

Our objection to not allowing boys under 18 to work at night would be on account of the increase of expense, but this is the only reason. We think that the increase would be more than the trade, having due regard to its being successfully carried out, could fairly bear. Labour is scarce here, and might fall short if there were such a regulation. Still this might settle itself in time by workers being attracted from other districts.

We do not think that the work hurts the boys' health. It is hot, but they can often rest, and have plenty to eat and drink. We do not find them subject to colds. Nor do they suffer from accidents by machinery or burns. The worst is, say, the loss of a finger.

92. *William Crampton*, age 10.—Stand in front of the furnace here and hold up the door each time the metal is drawn out. It is hot work, but does not make me sweat so as to wet my clothes. Work days one week and nights the other. When I work days I have breakfast at 5 before I come, again at 8½, and dinner about 1, as I get a chance. Sometimes stop half an hour for it, sometimes 1½. Get five bob a week, 1*d.* for myself. Worked in a coal pit a long time before I was here. Was not 10. Before I went they asked if I could read.

Can read a bit (not well). Go to school twice on Sundays.

93. *William Strafford*, age 13.—Work in the cellar of a steel melting furnace, working clay for pot lids, and watching the pots to see if they run. Also go up into the shop above when the steel is teemed, skim the muck off the top of the pots, sometimes hold a pot while the man puts another into the furnace, and help the teemer. There are 20 pots in this furnace, and they are teemed three times a day, which takes about 20 minutes or so each time. Am the only lad in this cellar, but lads do the same in others. When I am treading the wet clay and work hard it hurts me so across the belly that I can hardly stand, and I have to put my hands to it and stop working to get wind.

Came to work here five years ago, *i.e.*, when I was 8, and after I had been here three or four months was wheeling a barrow and two carts came up from different ways and I could not get out of the way. One catched me under the chin and knocked me down and hurt my leg, and took two pieces of flesh out a finger length. Was off work for it six months and a fortnight, and in the infirmary all the time.

[Weakly looking. Pants for breath.]

94. *Allan Bunce*, age 16.—"Pull down," *i.e.*, drag hot iron away from the rollers with tongs. A big boy takes it out from the rollers. When they are long pieces I get a little boy to help me. Get burned sometimes. Have a burn on my elbow (*shows large scar*). Catched a lump against my feet, and fell on hot iron. Work a week of nights and a week of days. If we make 16 heats there is no spare time, but if we make only 5 or 6 we have time to play us. Have no time hardly for meals, but get them between times. Go straight home from work, and usually get 10 or 9 hours' sleep. We reckon to have 10 hours' work, stopping at 5½, but sometimes stay till 6½, sometimes till 8, because the iron is different, and the same men must finish what they have to do, but this throws the other turn later. Get 6*s.* 8*d.* a week.

Went to a coal pit when 9 or 10, and worked afterwards at wire drawing, crinoline steel works, metal foundry, and pottery. At most of these the proper day's work was 10 hours, but we used sometimes to make a quarter of a day, *i.e.*, 2½ hours over. At the crinoline steel I sometimes worked three shifts together when a boy was away, and others often did so too. At the wire drawing worked in the night shift also. Used to be very tired when doing so.

Can read a bit. (Not well.) Go to school on Sundays; never to a night school.

95. *Thomas Cook*, age 13.—Sit and hold the handles to drive a steam hammer. Work from 6 till 6, days only. Half an hour for breakfast, an hour for dinner.

Can read, write, and sum. At school till here.

96. *John Morris*, age 14.—Strike hot bars to straighten them. Work days one week, and nights the other, usually from 6 to 7 or 8. At iron work three years here and two and a half in Staffordshire; only worked days there. Riddled sand. It used to ache my back at first. Only work five turns a week here, *i.e.*, five days or nights, not working on Monday. Get 6*s.* 8*d.* a week, and have 6*d.* of it for myself. For nearly a year have put 4*d.* out of this into the bank. Generally do shiver like this when I've been hot.

Do not go to school on Sunday or at night; have no good clothes to go in. Father makes 18*s.* a week, one of my brothers 10*s.*, and I have three sisters at work. Three of us are at home too little to work. Go to a church. (Q. What Church?) Some say it's Protestant, some Catholic. Parson preaches out of a pulpit, and reads out of a Bible, but I can't get nigh enough to understand the words. Have heard say that God made the world, and that all the people were drownded but one; heard say that one was a little bird. Suppose that Christ was a man. He was a father, and teached 'em to read out of a Bible. Think He *was* put to a cross.

[Pale and ragged. Shivers constantly though on a mild day.]

97. *William Smith*, age 15, moulder.—Sift on and blow off dust, &c. Work from 7 till 6, and begin at 6 on Saturday. The time that I stay depends on the iron. Do not often stay till 8, unless we are doing big castings. Earn 8*s.* a week, but do not get any of it. Came three years ago to work here for my uncle, who wrote to where I lived to ask me to come, as he had a place for me. Live with him. Go away an hour for dinner. Get a wash sometimes, not always.

Never was at day school in my life, except for a week or two, and do not ever go at night, but do on Sunday, and to chapel. My cousin teaches me reading a little. Heard at chapel about Samuel fighting with a lot of soldiers. Have not heard of paradise. The garden of Eden is where men goes and eats off a tree. It was not any particular man. Do not know if Adam and Eve were the first people in the world. God made man; man made woman.

98. I visited the Cyclops steel and iron works of the Messrs. C. Cammell and Co., which are on a like large scale, employing between 2,000 and 3,000 persons. The nature of employment and system of work, as to hours and other matters, is the same. A statement was made by the managing director to much the same effect as that made in behalf of the Messrs. Brown and Co., but cannot be inserted, as the manuscript has not yet been received back from the gentleman referred to, to whom it was sent for his revision. The answer, however, to question 7 of the Tabular Form asking for an opinion as to the prohibition of night work by children or young persons is, "It is impossible for us to do so; it would be tantamount to stopping our works." Yet of the whole number of persons employed, boys of all ages under 18 form little more than 6 per cent., and boys under 13 less than 1 per cent., and of both these classes several would naturally be engaged in day work only.

Stove grates.

MESSRS. STUART AND SMITH'S, STOVE GRATE, &c. MANUFACTURERS, ROSCOE PLACE.

99. The stove grate manufacture is one of importance, and is carried on in large manufactories in Sheffield and Rotherham. It includes other goods, such as fenders and fire-irons, &c. The principal processes are founding, grinding on stones, polishing on wheels, fitting or smiths' work, and orna-

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a.

menting, by bronzing, enamelling, painting patterns, &c. Highly heated stoves are used for drying the articles. At one of the leading manufactories I was informed by the proprietor that he had burst a thermometer in a stove at 450°, and that one in which I stood for a short time was then at a temperature of about 430°. This great heat, however, is while the stoves are closed, and not entered by any one, and boys apparently are not employed in connexion with them. Indeed, owing to the nature of the work the proportion of boys employed in the manufacture at all is small.

100. At the works of Messrs. Stuart and Smith it was stated that the hours are from 6 a.m. till 6 p.m., and regular, except for, perhaps, a month before Christmas, when the workpeople like to make overtime, working sometimes till 8 or 9.

101. *Edward Taylor*, age 15, moulder in the foundry.—Work from 6 to 6; never longer. Was at some rolling mills before. The proper hours were from 6 a.m. till 5½ p.m., with half an hour for breakfast and an hour for dinner; but we worked all hours. In the nine months that I was there I worked about four nights in every week as long as till 8½ in the evening, excepting three months, when we worked nights one week and days the other; and for about four months worked one day and night together every week, and sometimes two days and two nights running without stopping, except for meals and at odd times when the heats were not ready and we could rest a bit. We had the full times for our meals except on Saturday, when we sometimes worked on through dinner, so as to give over at 3½ instead of at 4. My regular wages were 6*s.* a week, and I had 3*d.* for two hours' overtime. Sometimes was tired when working two days and two nights together, but not when working on till 8½ p.m. Sometimes used to fall asleep at my work, and then a lad that I worked with would give me a bit of a shove to waken me. There were about 18 boys in our mill, the youngest about 12, and there were about four in the sheet rolling mill, where they worked nights too sometimes, though not so much as we did. The sheets were rolled hot. When we worked the longest it was at rolling ramrod iron, but we rolled all kinds at other times. Took out the bars of red-hot metal at the back of the roller, pieces about as long as from here to—(20 feet or more). Sometimes the guides got wrong, and turned the bars on to us. Was burned into my leg myself once, and a boy of about 13 was burned right through his leg, the hot metal passing in one side and out the other. He was away four or five weeks for it. We did not often fall when taking the metal back, unless the place was hot and slippy. The boys had to slur back to the roller, and when they have to look sharp about it, that makes it slippy.

Was at printing also as errand boy, &c. in the office of a weekly newspaper, and went from 8 to 8; but on Fridays had to work all night folding papers, but not every week. There were four other boys, two younger than I was.

Go to school on Sundays and three nights a week, for which I pay 1½*d.* Can read, write, and do sums, *e.g.*, reduction. Do not know what 10 times 12, or 3 times 7 is. Have almost forgot 'em all. Do not know of London; never learned any maps.

102. *John Coleridge*, age 17.—Polish at a wheel. Went to type founding when I was towards 9 years old, and broke types off. The hours were from 7 till 7, with an hour and a half for meals.

Then went to cutlery, when my hours were from 7 a.m. till 7 or 8 p.m.; the same meal times.

Can read a newspaper and write, but do not go to night school because I have very bad eyesight for seeing by gas light.

Steel.

MESSRS. T. TURTON AND SONS', STEEL MANUFACTURERS, SHEAF WORKS.

103. A simple safeguard used in the rolling mills here might with advantage be adopted in rolling mills more generally than it is. Rollers, of course, must always be exposed to allow of passing the metal through them. But between each pair of rollers, of which there are usually several in a line, is a space in which the ends of the rollers and the connecting shaft revolve.

104. Horrible accidents have in some places happened from boys getting on the wrong or putting-in side of the rollers, and, if once caught by the machinery, drawn in in a moment, and of course crushed. The intermediate spaces, in which it is stated that this is most likely to happen, are in the Sheaf works covered with an iron saddle, which can be easily lifted off when there is need.

105. The number of persons employed here varies, but is, I was informed, towards 1,000. Some of the boys' work is hot, particularly that of the "firers," who stand in front of a furnace, from which they take out large bars of steel used for springs, and hand them to a man who cuts them at a machine. A boy of 12 (No. 107), who helps this man, is exposed to the heat of the bars which are thrown in a heap close by.

106. *John Willey*, working manager of the rolling mill.—There are about 22 or 23 boys, from 10 or 12 years old upwards, in the rolling mill under me. They take work at the backs of the rollers, taking out the hot rods, &c. They work from 6 a.m. till 6 p.m., with two hours for meals. Sometimes we work in day and night turns, but have not done so for the last three months, as the amount of work has not needed it. Sometimes when we are not working night and day sets we make a quarter of a day over, *i.e.*, till 8 p.m.

We have not had any serious accidents here. Of course the boys get burned sometimes, but none have been pierced or seriously hurt with the hot metal. You have heard, I dare say, of boys going through the rollers. It is not through the rollers themselves, but through the space between two adjoining pairs of rollers, and happens from boys getting to the front instead of the back of the rollers, which is their proper place. A little plan which I have invented prevents an accident of this kind so far as this space is concerned. It consists merely in putting moveable iron covers over that part of the machinery.

[Some boys at the rollers gave much the same account of their work. Their faces were grimed with black.]

107. —— *Rogers*, age 12.—Don't know my christian name. Am now sitting by the man who cuts off the end of springs at a machine and throw away the waste ends. Usually I fire, *i.e.* take the bars from the furnace where they are put to heat. The work I am at now is hot, but yon is the hottest. Work from 6 a.m. till 6 p.m. Sometimes make a quarter over, *i.e.* till 8½ p.m. Once worked here all day and all night and all the next day again. Have been here about a year.

Steel, saws, &c.

MESSRS. JOSEPH PEACE AND CO.'S, STEEL AND SAW MANUFACTURERS, NEEPSEND.

108. The building in which the boys were rolling cold steel is gloomy and cramped. I had barely room to reach one of the boys to speak to him at his work. The ground was sloppy from this work.

109. *Mr. Joseph Peace.*—We melt, tilt, and roll steel, and make saws, busks for stiffening, and other articles. There is only one cellar boy. We have also a wheel in the works for grinding and glazing the saws, and make and fasten on the wooden handles. Some females are engaged in the shops and warehouse at presses or flies, japanning, and other ways.

Three or four boys in the saw department are in our direct employment, but the others and some of the females are employed by men. The boys are, I believe, well treated and paid, as they are not fastened to the men, and could run away to some one else if they were not satisfied with their present masters. Where they are bound their master is, I fear, often a tyrant to them. Saw grinders have the privilege of bringing up their sons to their own trade under them, which in other trades often is not the case. Consequently they bring their lads in very young, some as young as 8 or 10 I should say. The boys glaze on a wheel as it is a light work, but it is less healthy than saw grinding on account of the emery dust which is always flying about. They stand to work, not sit. Saw grinding is reckoned at the top of the grinding trades for healthiness. The grinders like to work as short a time as they can, and often work less but never more than the day of 12 hours, including meals. The melters also work only by day, and do not make more than three meltings here, though I have understood that this is done in some places.

Most of the other work goes on day and night from 6 to 6 or 5½; and in some other work, which usually goes on only by days, if there is much to do we prefer to work all the 24 hours round with two sets of hands instead of making overtime. The engine must anyhow be running for other parts of the work. In parts of the work which do not depend on power, the men sometimes get behind early in the week, and we let them stay later at the end to make it up, *e.g.* till 8 p.m. instead of 6. There is an hour and a half for the two meals. On Saturdays all give over at about 3 p.m.

The night and day set change week by week, because men could not stand working always by night only. It is true they get more holiday than the day set during the week, as they can spend part of the day in pleasure, but this is taken from rest, and the night air is not good for them. The change to a week of day work, however, seems enough to refresh them.

I wish myself that we could do without working at night at all, as we could if the prices would allow of it. They are so low that to make a profit the machinery must run as long as it can. We could not employ a double number of hands by day instead, because the machinery and space are occupied and double of both would be needed. If boys under 18 could not work at night, men must be employed instead, and we must charge more for that, so that things could not be sold to the consumer so cheap. That would be all. The manufacturers being all on the same footing by law would keep the prices up, much as at present the men keep their prices up with us by means of their union. The difference of price would not, I think, be sufficient to discourage the trade. Youths do not usually get full men's wages till about 21. Perhaps boys over 14 might be allowed to work at night, but not any younger. But on the whole I think that it must be injurious for any boys to be working at night. They cannot sleep and get proper rest by day, but will be running about. It has sometimes happened that the mill has stood, *i.e.*, been unable to work, simply because boys belonging to one set have been away. If the want of workers is discovered in time it may happen that others are stopped out of the preceding set and persuaded to make the other up, but usually they are away too soon. It may happen sometimes that boys are thus kept without our knowledge.

Accidents happen in the rolling mills from carelessness. We have never had any serious ones in ours, but we have had many narrow escapes. Only lately a boy was pitched over a wheel and left lying under it as it was going. This happened from the machinery being started before it was known that anyone was in danger, but he was partly to blame for not having taken his bar out of the roller, as he should have done.

Accidents also happen at grinding from the stones breaking. I do not know that they are less frequent than formerly. When such an accident happens it is serious. The marks of one which happened lately here are shown by a hole in a solid brick wall caused by the flying of a stone. The new plan however of fastening stones is much safer than the old. Now the axle does not touch the stone, but passes through a large hole, being fixed by means of plates, so that if the axle heats and therefore swells it does not burst the stone. Formerly the axle was fixed tight in the middle of the stone by means of wooden wedges, and then when the axle heated it swelled and made the stone fly.

The grinders are not at work to day (Monday) because the "rattens" have been in the night and taken away their bands. This is done as a means of enforcing the subscriptions to the trade unions if any of the men are behindhand with them. When the subscriptions are paid the bands return. The men, however, care little for not being able to work, as each receives 7*s.* a day from his society out of the fund to which he contributes. It is my opinion that these trade unions are mischievous and ought to be put down, and that in place of them there should be a court, with legal authority to decide in all cases of dispute between masters and men as to wages. We should have much more satisfaction in submitting to such an authority, and I believe that many of the men are tired of subscribing merely for the benefit of paid secretaries, &c., whose interest it is to keep up these trade unions, and would prefer a court of this kind to decide disputes.

110. *John Cawthorpe*, age 14.—Backer at a roller, taking out hot steel. Am used to this job now, *i.e.* hot steel, as I have been at it five years. Often get burned with it. (Shows scars on hands.) Once had the steel almost through me, here in my thigh (close by groin). The man was shoving it through when it was getting cold, and it turned so and caught me before I could get out of the way. Went to the infirmary for it and was laid up two months.

Work one week on days and the other on nights. Sometimes start at 6 on Friday morning and do not give over till 2 p.m. on Saturday. That is the only time that I work night and day together. Sometimes I work a quarter (of a day), *i.e.* three hours over; sometimes a half. When I have been working three turns I get tired. Get some sleep in the dinner hour, and sometimes in the breakfast half hour. When tired I fall asleep in working time, not when standing up, but many a time when I am sitting down. When it (the hot steel) comes through it wakens me. It is very heavy work, and when they first come through the rollers I can hardly lift them, but when they get longer it is easier. The men are very kind to me. The lads do not get hurt in the machinery.

Can read a little bit, but not write or read writing.

111. *Patrick Manger*, age 13. At cold steel rolling. Work only by day, properly from 6 till 6, but sometimes make a quarter over, *i.e.* till 8½ p.m. At another place, where I did the same kind of work, have made half a day over for a week together, *i.e.* working from 6 p.m. till 12 (noon) the following day, and have worked for a night as well as my day shifts, *e.g.* from Monday morning till Tuesday night, not getting to sleep till then, but have not done this often. Get 8*s.* a week, and sometimes 2*d.* or 4*d.* of it for myself.

Cannot read, but can tell the letters. (Reads very short words.) Go to Sunday school sometimes.

112. *Henry Kay*, age 10.—Fasten rivets for busks with a hammer. Get 3*s.* a week. Mother puts 3*d.* at bank for me. Went to work when I was going 10. Can write. Go to Sunday school.

Metal Manufactures.

Sheffield District.

Edge tools.

Mr. J. E. White.

a.

MESSRS. WARD AND PAYNE'S, EDGE TOOL AND SHEEPSHEAR MANUFACTURERS, WEST STREET.

113. Some of the warehouse work here, as in many other warehouses, is strictly manufacturing. Two or three boys bend and hammer shears, oil them, &c. About a dozen girls, apparently from the ages of 12 to 17 or 18, also rub off oil and wrap up goods, &c. Part of the grinding wheel is let off.

114. *Mr. Ward.*—The hours in these works are from 6 a.m. till 7 p.m. with two hours for meals. The girls and a few boys in the warehouse, who sort, rub off oil, wrap up, &c., work from about 8½ till 7. Sometimes we make overtime, according as work requires it. Now for about a week or 10 days we shall be making overtime till 9 p.m. In the week before Christmas our custom is for the hands to make 15 hours a day to enable them to make up for the holiday which follows.

I do not know how the factory system will answer. I find that foreigners can now produce goods at much less cost than we can, and this is the case not only in goods such as we make but in textile goods too. If we are tied only to work within certain hours it might put us at still more disadvantage as compared with foreigners. If people could be persuaded in consequence of such a limitation to give longer notice, it might be well enough; but that is unlikely. There are certain seasons in our trade, and we expect certain orders at given times, but though we may think that we have arranged to meet them, they may turn out to be larger, or others may come in at the same time. To some extent we can make up by taking on extra hands, but sometimes we have to pay a large bounty to attract them. There is sufficient likeness in some of the kinds of work carried on in the town to allow of getting hands from one trade to help in another. The end of the Russian season causes a push just now, as goods must be sent before the navigation is closed. There is little, if any, difference in the time of this in different years. The last vessel nearly always sails somewhere about the first week in November.

115. *George Allinsworth*, age 9.—Came here as cellar boy last Friday. Next morning we had to begin at 3, so I stopped here all night. Live five miles off. Slept on the floor of the furnace overhead, with an apron under me and a bit of a jacket over me. The two other days I have been here at 6 a.m. Aye! it *is* hot in here.

Before I came here I was nearly a year at the same work at some works in the country, a very large place. Began there too at 3 on Saturday mornings, always did; but was very gain home and could sleep at home. Other days I began at 6 in the morning and gi'en over at 6 or 7 in the evening; but it depends. Saturday afternoon I give over at 2 or 3. Go up into the furnace and carry away the waste after they have done teeming.

116. *John Allinsworth*, father of last boy.—Work in the furnace. Last Saturday morning we began work at 2. We had slept in the furnace, being strangers to the town. We live at Wadsley, four or five miles off. We have to be here by 6 a.m. It *is* a long way for the boy to come and go back each day, though I can manage it. I should like to get some place in the town for him to stay in.

117. *Ellen Depledge*, age 12.—Oil and wipe edge tools in the warehouse. Have been here nearly a twelvemonth. Our hours are from 8 a.m. till 7½ p.m. Am now working overtime till 9. Think that now we shall have to come at 7 or 6 a.m. and work till 9 p.m., from now (beginning of November) till Christmas. Have not had orders to do so, but it is what the girls here say.

118. *George Albert Parker*, age 12.—Oil shears in another room of warehouse. Work from 7 a.m. till 8 p.m., or, when we make overtime, till 9.

Was in a screw-mill before. Worked there from 7 till 7, and when we made overtime from 6 a.m. till 8 p.m. Went to blade-forging at 9 years old.

Steel.

MESSRS. SANDERSON BROS. AND CO.'S, STEEL ROLLING MILLS AND FORGES, ATTERCLIFFE.

119. At these works, in a village near Sheffield, steel is rolled into sheets, rods, and wire, and forged at forge or tilt hammers. The firm have two other works, one place near, the other in Sheffield, at both of which steel is melted. Boys work at all. At the Attercliffe works the noise of some of the machinery is deafening, making it almost impossible to talk. The wheels are well fenced.

120. *Mr. E. F. Sanderson.*—The boys are all employed by the men, who are generally their own fathers or friends. At the rolling-mills and forges the work goes on night and day, from 6 to 6 in one branch and from 12 to 12 in the other, but out of this two hours are allowed for meals and the men often come one, two, or more hours late or leave as much earlier. There is no special reason for the distinction of working from 12 till 12 or from 6 till 6, but the men's own choice. Those who work in the nights one week work by days the next, as is the rule where there is regular night work. The health of the men requires this change, but that there is no bad effect from either the nature of the work or the night work so arranged is shown by the great length of time which many men have continued in our employment and their general health and strength. It might be expected that the heat of the work would make them intemperate, but this not the case. One man, who for a long time had bad health and pain in the stomach, was quite cured by coming to work here, which was attributed entirely to the great perspiration. As far as I am aware, the melting is not less healthy. That is only day work, the men working till they have finished three rounds of melting. This is the general rule of the trade, and the work cannot be lengthened, because neither the men nor the pots could stand it. We at least have never done more, except for trying some pots. If more work is wanted, as is sometimes the case, a fresh set of hands and pots are put on to work for the whole night, but this is very rare. The boys who work at the melting are cellar boys, who make pot-lids, &c., and watch the pots while the steel is melting. This is hot work, but not unhealthy that I know of. Boys do not get to help in the casting shops themselves before the age of 16 at least.

Great difficulty would be caused by preventing boys under 18 from working at night. The chief would be the increase of cost from employing men instead of boys. I cannot say what this would be, but probably it would not be enough to enable the manufacturers to raise the price of steel, and consequently it would fall on them, as of course the men would refuse to pay it. Only 5 of the boys here are under 13. The wages being paid by the men who work by the piece, I cannot say just what they are. Perhaps the younger boys get from 4*s.* to 5*s.* a week, and the elder rise from that up to 15*s.* to 16*s.* Probably youths of 18 could be got now for 17*s.* or 18*s.*; but if all the works in the town had to get youths of that age the available number probably would not be sufficient. The boys' work is of a kind for which the strength of boys is generally quite sufficient, and consequently there would be no gain in the greater strength of the men to counterbalance the loss, or it would be only in the few cases in which the metal is heavy. The men would not like so well not to have boys under them, as men would be less obedient. Besides, boys must begin young to learn the trade. Leaving day-work alone open to boys would not answer this purpose, as owing to the men working days and nights in alternate weeks, the men would be separated half the time from their boys, and would thus lose half the profit which they make from them. The training which they give to an apprentice is considered as part of the return for the boy's labour, and thus enables the men to get it at a cheaper rate. Each man would want half of this profit. In addition to this it would throw regular night-work on those who worked instead of boys in the other turn, which they would not stand. The difficulties, in fact, would be so great that they would very likely lead to giving up night-work altogether. As far as the work itself is concerned, this would suit as well, but then there would be the loss from so much expensive machinery lying idle half the time, and to get through the amount of work which we are able to do on the present system, we should have to double our premises and plant, which would double the outlay. It is true that there is this loss from machinery lying idle in those manufactures in which work now only goes on by day. But the use of furnaces would involve a further loss in our case. If these were kept up there would be a waste of fuel, and if they were not there would be loss of time in laying the fires and getting the heat up, and the furnaces themselves would suffer from the changes of temperature. The larger the furnace the greater the loss. In the rolling mills the furnaces are larger than in the forges, and are never let out even on Sunday, or if the works stand for some days. The smaller furnaces in the forges are let out on Sundays. The melting furnaces are also let out each night, but this is necessary to clear the bottoms, and the pots, if put fresh into a furnace already at full heat would be liable to be spoiled. As it is, the furnaces do not get cool in the night, and the pots are gently warmed before putting them in the first time, each pot serving for the day of three rounds.

If the limit of age at which night-work was allowed were fixed at 16 instead of 18 the difficulty would be far less, but would still be felt.

We have been very fortunate with regard to accidents. I only remember one happening to a boy who carelessly got his hand into the roller, and one to a man who was run through the body with hot steel. The boys are seldom burned, except when they first come, and that makes them very careful afterwards.

121. *John Smith*, age 15, tilter.—Have been so a year and a half regularly, but 3 years learning and all, having been a heater at first. To tilt I sit in a chair, which swings backwards and forwards. It tires my arms and wrists, and when I have done work I feel my back ache, but not at the time. Do not always sit, but when I use the big hammer for doing heavy ingots I have to stand. These tire me most. Work from 12 a.m. till 12 p.m., and stop ½ an hour for tea, and an hour afterwards; the engine stops. Am 'prentice to my uncle, who gives me a shilling or two a week to spend. For the first two months I had nothing, then 6*d*., and did not get to 1*s*. till I began to tilt. All the other boys in this building work for their fathers, except one who works for his uncle like me.

Wasn't very well when I was at heating. It was too hot. Had the sick headache and all, and was not often without it. Was strong before, and came out of the country 5 miles off. Have not had the headache since I left off heating. Used to get burned when at heating. The heats slip out of the tongs and burn us arms. Once I had to leave off work a month for a burn. Think about 20 boys heat in here. The boys in the rolling mill often get burned at legs. This wears their trowsers, but does not hurt them much. We wear leathern aprons at heating and tilting and all.

Was at school till I came here. Cannot go in the evening, as I am at work, but go on Sundays always, and to chapel. Can read a little (can only spell a few monosyllables badly). "Prayer" is what you say at night. Learned some at school, and say them. Tried sums. Can set 'em, but can't add 'em up.

[Sallow and languid.]

MESSRS. WM. JESSOP AND SONS', STEEL MANUFACTURERS, BLAST LANE, FORGE LANE, AND BRIGHTSIDE.

122. The Messrs. Jessop are very large manufacturers—as I have been informed, the largest in the world—of steel, such as is used for purposes such as cutlery, pens, &c., for which steel of the truest kind is required. They have three works, at the places named above, two in the town, and the third, the largest, about a couple of miles from it in an airy situation covering 24 acres of ground. The chief branches of work carried on are the conversion, melting, forging and tilting with hammers, and rolling. The converting is men's work, and the melting is carried on by days only. In the remaining processes boys are employed, and work by night and day in relays, as in iron work. The melting furnace work itself requires the full strength of a man, but boys are employed as helpers in miscellaneous ways, *e.g.* sweeping up, throwing scrap metal into the pots, stirring the fuel, &c.

123. In addition to the departments for manufacturing the steel there are others for the preparation of fire-clay, and making it into melting pots, of which a very large number are required daily, the pots becoming worthless from the extreme heat after a day's use. There is also a carpentry department for making the packing cases in which the goods are sent off.

124. A statement of the views expressed to me by Mr. Thos. Jessop, mayor in both the past and present year, sent to him for his revision, was unfortunately mislaid. They were much to the same effect as those expressed by other leading manufacturers, and so recorded.

125. *Robert Newbert*, age 14. I "heat," *i.e.* hold bars in the fire with my hand to heat them and put them under the tilt for the tilter. Am apprenticed to him till I am 21, and have been with him a year and a half or so. Live with him, and get my meat and clothes but no wages. That is the usual way. T'oldest apprentice, a lad of 19, gets spending money, as he is a tilter now, and has been 2 or 3 years. Shall begin to tilt myself when I am clever enough. Come on to work at 12 at night, and work till 12 in the day, stopping half an hour at 5½, and again at 8½ for meals. Most work days one week and nights the next. Always get to bed at about 5½ in the afternoon, and do not stay up later to play, even in summer. Get some play after I have got home and had my dinner. Often get colds. That is from going out without our clothes when we've been sweating hard, as we do when we work hard. The colds do not hurt me or give me pain anywhere. One boy, younger than I, works near me, and one a bit older. The younger comes nights and days, and puts coals on the fire, and keeps the steam up.

Was at day-school before I went to a colliery, and go on Sundays now. Can read, but very little, (spells), and cannot write at all. Can count pretty middling, and do the little uns (sums). Don't know what 9 times 9 is. Have not heard of India. A whale is great big bone jaws.

Metal Manufactures.

Sheffield District.

Steel, files, &c.

Mr. J. E. White.

a.

MESSRS. IBBOTSON BROS. AND CO.'S, MANUFACTURERS OF STEEL, FILES, SAWS, TOOLS, &c., RUSSELL STREET.

126. *Mr. Alfred B. Ibbotson.*—The chief branches of work carried on upon our premises are steel melting, converting, and tilting, railway spring making, file making, consisting of the forging, annealing, grinding, cutting, hardening, &c.; also saw making, including paring, toothing, hardening, grinding, and glazing; and the manufacture of small engineers' tools. A very large portion of our steel tilting and rolling is done for us at various establishments in Sheffield, many large works here being exclusively employed in tilting and forging for the different steel makers; and this kind of work usually goes on night and day, and I believe that boys are usually engaged in it. On the whole we employ more persons off our premises than on them, particularly in file cutting. This is done chiefly at the houses of the workers, and it is in this way that the greater part of the workers in the file trade are employed.

In the Sheffield district, files are made by hand labour only. The forging, grinding, and cutting could be done by machinery equally well, and at far less cost; but the jealousy of the workmen on this point is so strong, that no manufacturer can venture to introduce machinery for the purpose. It would not be safe for him to do so; otherwise, we could introduce machinery with great advantage. Abroad, however, the cutting is very extensively done by machinery, and in France excellent looking files are produced in this way, as I have myself seen; and indeed the French are now selling large quantities of files to our customers on the continent, almost equal in appearance to ours, at little more than one-half our price. And although, seeing that the demand upon us for files is continually increasing, we must presume those French files to be very inferior in quality to ours, yet we are persuaded that any inferiority which exists is caused, not by mechanical difficulties or any inability of the machinery (if under experienced hands) to do the work well, but by the want of equal skill and knowledge in other important processes, such as the preparing of the material, as well as tempering, annealing, &c., which all require great study and experience. Thus to produce a really good quality there are several necessary operations which can be performed only by experienced men, and these will have nothing to do here (which is the great seat of the trade) with work any part of which has been done by machinery. This throws a great difficulty in the way of machinery being used profitably for the purpose, even in other places in England. If this jealousy were to disappear, I have no doubt that the forging, grinding, and cutting of files would soon come to be done by machinery in Sheffield. It is very important for the interests of the English trade that it should, for it is obvious now that it must in the end suffer if the work can be done, as it can, at a much lower cost in other countries by the use of machinery. The reputation, however, of the Sheffield work is deservedly so great, and there are such advantages here for the manufacture of steel and steel goods, that in spite of the present impossibility of introducing machinery here, it is likely that the manufacture will continue to be carried on here on the present system on a very large scale, at any rate for a long time.

The same difficulty prevents the introduction of machinery in other branches of our trade. The Americans have machinery for saw grinding, which produces beautiful work at a third of the cost here; and one of us has been in a manufactory there where this was done.

I think it right that children and young people should be protected by law from any injury by overwork. As regards any limitation of night-work, it is an important but difficult question as regards many of the trades carried on in this district. I am not, however, in a position to offer an opinion of much value about it, as we have so little night-work; but as regards a limitation of day work to 12 hours only, it would not matter to us at all; and I think that there is no trade in Sheffield that would be injuriously affected by the passing of a law to that effect.

127. *George Batty*, working manager of a steel melting department.—The men and lads come at $5\frac{1}{2}$ or 6 a.m. and are expected to be ready for work at 6, and have done by 5 or 6 p.m. On Saturday they come at 4 a.m. and finish earlier. We used to begin at 2 a.m. on Saturday, but the men coming so early used to get a bit sleepy, and when they left work got to drinking. Beginning at 4 instead of 2 a.m. is a great improvement every way. We get them to work in the morning better, and when they go away they spend their time better.

We make usually only three rounds in a day. If we are very throng we make four, but this does not add more than three hours work at the outside. Each melting takes less time than the previous one. From the time that the hands come till the time that they finish the first melting takes about $5\frac{1}{2}$ hours, the actual melting taking about $4\frac{1}{2}$. The pots might hold out for five meltings, but not to any profit. More would be wasted than was gained. Two lads work for me, one aged 13, the other 12. They make lids and stands in the cellars and watch the pots. When we are teeming they come up to help, slitting the flux at the top of the pot with a bit of steel to let the metal run out.

128. *George Bagnall*, under manager of the file department. There are usually a few young boys and youths in the file cutting shop. They begin file cutting at from 10 to 12 years old. The shop is open at 6 a.m. and closed at 8 p.m. if any like to work as long; but in the fore part of the week the workers often take their breakfast before they come, and on the latter part come at about 7 a.m. and stay till 7 or 8 p.m.

The lead used to cut the file upon and the dust which flies up make it unhealthy work; forging is a deal healthier. Colic is a very nasty complaint amongst file cutters, and you scarcely ever see a file cutter with good teeth; that shows the effect. Their teeth generally begin going when they are about 18. Sitting and stooping too so much over the work, as is necessary, is bad for the chest. Dr. Holland, who studied the health of file cutters and wrote about it, said that they ought to be very particular to wash their hands before every meal.

An account of the file trade is taken every year. There are now very nigh on 6,000 men and boys and 700 women and girls at work in it, *i.e.* including both payers and non-payers (*i.e.* to the society). Of the 6,000 about 4,000 probably are men, and the remainder boys from 21 down to 10 or 9. The females are of much the same age. I have, however, known cases of children beginning work at 7 or 8 years old. There is some work which they can do for men, such as preparing the files, before they are able to work by themselves.

It is a rule in the trade that a file cutter may have one apprentice and one only to work for him and his own children also, but if he has once taken on his own children he cannot take an apprentice. In any case he cannot take on the child of another person unless that person be a file smith. The small masters however are not bound by these rules, and take on boys as they please. A parent will sometimes pay him 5*l.* or 10*l.* as a premium and perhaps the child's first year's work also for nothing. The small masters will do work at a lower cost, and so are nearly sure to be always full of work, and with them the boys have to work very hard and very long hours. A small master will have a dozen lads or sometimes two dozen, from the age of 9 or 10 upwards. I know one who has only two men and a dozen lads.

There is a good deal of heavy work. I have seen a boy of 14 years old using a 22 lbs. hammer in file forging and some who have grown completely out of form from the work. The hammer used by boys for cutting is usually from ¼ lb. to 3 lbs. weight; men use up to 9 lbs. The weight which is lifted so in the day is wonderful, and I have often heard men reckon the number of tons that they have lifted and the number of thousand strokes that they have made in the day.

129. *Thomas Bagley*, age 12.—Have been a file cutter about a year. Work usually from 7 till 7, and on Fridays till 7½. Take an hour for dinner. On Saturdays come at 6 a.m. Can read any book, and write.

130. *Charles Stork*, file cutter, in a yard leading from Watery Lane, Sheffield.—There are a great number of small outshops like this in Sheffield, in which file cutters work, usually from three to six in a shop. In these they begin work at 7 or 8 a.m., and work to 7, 8, and 9 p.m., and towards the end of the week till 9 or 10 p.m., beginning often on Thursday and Friday at 6 a.m. File cutting shops in factories are opened at 6 a.m., and close at 7 or 8 p.m. The lads have to be at work at 6 a.m., though the men often don't go till 8 a.m. Young boys give over at 7 or perhaps 8 to go and play 'em. Not one file cutter in six gets his dinner on Saturday, unless they finish on Friday night. Many that can raise them haven't time to eat them, and others can't raise them. Women and girls sometimes work in their houses, as well as in small shops; but boys have to work in a shop with a man, as they must be taught their trade by men.

It is reckoned that there are about 3,000 men file-smiths, *i.e.* makers and cutters, members of the trade, and 500 or 600 who are not. There are also many boys, girls, and women file-cutters, especially out in the country. Hardeners and grinders form different trades. Some children begin the work at 9 years old, but respectable men don't reckon to take them on till they are 12. The age at which they are put depends on whether the father drinks. A man generally sets his own son on. My father and grandfather were file cutters. Some small masters will take four or five boys. Boys are generally bound from 14 till 21, and, as apprentices, generally get half of what they earn; from 18 to 21, lads will make perhaps 1*l.* in a week, but they only get 10*s.* of it. For the first two years after they are loose they don't earn 15*s.* perhaps, but they get it all.

File cutting is very unhealthy work to the belly, causing colic, and it makes the hand weak, owing to the lead and the constant strain. The left thumb and wrist are strained by holding the chisel constantly, the right by the hammer. Each cut takes a separate stroke. Such a file as I am now using has 1,000 cuts on each side, for which I use a hammer of full 7½ lbs. weight, and 300 cuts on one edge, for which I use a 3 lb. hammer, and I can make 20 such files in a day of 10 working hours (*i.e.*, he lifts about 142 tons weight in a moderate day.—J.E.W.) The right hand and wrist often become weak and waste, and get knots in the tendons. My right wrist is smaller than my left. (It is quite slender.—J.E.W.) Owing to the pressure of the chisel the left thumb is stunted and never grows properly, and also gets bent back, and is liable to have warts like this on the end, which are very painful. (The other workers showed like warts.—J.E.W.) The man to whom you spoke and who is just gone out has smashed up his thumb and wrist and altogether. He is only 37, but it will take him all his time to live till he is 40. He has worked very hard, viz., from 5 a.m. till 10 p.m., and on till 7 p.m. on Saturdays, for many a month together.

We use candles because the owner of the shop, who is not in the trade, would not be at the expense of laying gas down. But gas would be a deal better for the work and cheaper. It would cost me only 2*d.* a-week instead of 4*d.* or 5*d.* But it would be very hot, and in a small shop like this we should be melted by it.

File cutters were a very drinking set, and unable to read and write; they were reckoned to die from drinking at about 40; but the condition of the class has been very much raised, especially within the last 10 years, by means of schools and greater education. Now most can read and write, and many, being more educated and drinking less, work on till 50. It is a scandalous shame for any lad to grow up now and not be able to read and write; he can get a first-class education at an evening school for about 3*d.* a week.

They will never get the Factory Act in the file trade, because if ever the master is out of the shop the lads are sure to get and play 'em.

> [A young woman who worked in the shop remarked, "We have worked here all night "many a night." The man referred to as injured by his work looked in very poor health, and old and worn.]

131. Specimens of the country file work are given below, as furnished by two villages, each a few miles from Sheffield; viz., Ecclesfield and Oughtibridge, which are two of the chief seats of this kind of work. The first witness works with only an apprentice in a small shop in a yard. The working position, as observed in this shop, is constrained and uncomfortable, the seat being a sharp-edged form or horse, on which the cutter sits astride, the left foot being raised on a step on one side of a broad block in front to bring the leg up as a support to the chisel arm, the right foot on the other side holding down a strap passed over the file to hold it in its place when struck. The body leans over the block. To keep the under side of the file from being injured by the iron plate on the block while the upper side is being cut, the file is rested on a small piece of lead of the size and shape needed. On measuring the used up with the new pieces it appeared that in average use a piece of three or four inches long and half the breadth is reduced by cutting and pressure in one day from about three-eighths of an inch to less than one-eighth of an inch. Some of the lead thus lost finds its way into the bodies of file cutters, as described below and by some medical writers. See also third Report of the Medical Officer of Privy Council. The amount of lead used up in this way by file cutters generally is considerable.

132. *George Greaves*, file cutter, Ecclesfield.—Work in my shop here for a large factory in Sheffield, and am teaching an apprentice, now aged 20, here for the same master. In the village the work is generally done in a little shop like this, but sometimes a man may work in his house or put up a stock there for a little girl. The general plan is to have files ready shaped out from a Sheffield manufacturer, and to take them in on Saturdays, or on earlier days if wanted, being paid so much a dozen for the labour. Children begin at from 9 to 12 years old. At first they do not pay for the trouble and are only loss. We always want to have a boy the first 6 months for nothing. Then perhaps, if he is clever, he may earn 4*s.* or 5*s.* a-week. In light work, such as edges and small files, in which quickness is wanted more than strength, girls will do and earn more than boys. Some girls and boys of 12 or 14, if they are quick and work hard, may earn, I should say, towards 10*s.* a-week. Some are slow, and can never get to work well.

There are no regular hours of work in the trade; we work as we please, but about from 8 to 8, with meals, is perhaps the most usual time. I work, perhaps, from about 8 a.m. to 9 p.m., with several long rests as the work is tiring. Some work but

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very little in the fore part of the week, and very hard at the end. Some men, perhaps, begin as early as 4 a.m. or 5 a.m. on Friday, and see but little bed till Saturday; but the work of the young does not depend on that of the men.

Taking file cutters generally, they are not healthy. A doctor near here used to say that they were more like rotten sheep than anything. After a man is 40 they begin to hiss at him and he goes down hill; though I do know one of between 50 and 60; but after about 40 a man's health is not so good or his hand so steady, and he only gets common work, or, if trade is bad, is thrown out altogether, the masters liking younger men. We have to sit leaning over the work so, which makes the back and side ache at first, and mine do still very much when I sit at work hard. You hardly see any file cutters but what are bow-legged from sitting with legs each side the stock.

The lead too on which we cut is bad for us. Though we do not appear to touch it, it does reach us. You can see a fine dust always rising from it when the file is struck (*shows*), and we draw this in. Besides, we are constantly handling the lead to shift it, to place it right for the work; and often when our fingers are too dry to hold the chisel well, we put them to our mouths to wet them; and we often have to brush off the dust from the iron-plate on which the lead rests with our hands, so (*showing*), or the lead would not lie so firm. A piece of lead soon gets worn out, more or less quickly according as the files are fine or rough. With an average kind of file such as this, a piece lasts about a day, but with some kinds it may last three. We keep moulds in which we "teem," *i.e.*, cast our own lead, and use up the old thin pieces.

Dr. Hall, of Sheffield, wrote in the papers to say that file cutters should be very careful, and that no one ought to eat his meals without washing his hands, or sleep in the same shirt in which he works. One file cutter here lost the use of his arm, and the doctor said that the lead had got into him. The work is bad for the appetite too, I think. I many a time feel fainty, and do not know how to eat anything, and when I am poorly have to be propped up because I feel such a beating here (chest).

[Looks under 40, and not healthy.]

133. In Oughtibridge, also, files are made as well as cut in small shops, in which from two or three to half a dozen persons work. The workers were described to me as in a very comfortable condition, and not much given to excessive labour.

134. *George Ibbotson*, file cutter.—Six persons work in my shop here at forging and cutting files. Myself, two men, and three of my children, two of them boys and a daughter. I set the boys so much to earn in a day, and this keeps them about 9 or 10 hours at shop. My daughter, Sarah, is on her own bottom. We weigh in to the manufacturer, who sends a person round at intervals for the purpose. Payment is always made in money. There was a deal of barter, and people had to take cloth, &c., but it has not been so of late. There are plenty of file cutters in the place who work 14 hours a-day, starting while 6 a.m. and working while 8 or 9 p.m. Some make more than 14 hours a-day at times; it depends on how trade is. Very often them that is bound apprentices is kept close to their work. File cutters usually do not work more than six or seven hours on Monday, and little on Saturday. The work is done in shops like this.

135. *Thomas Blackburn*, file cutter.—Most people in this village are file cutters. Some of the largest shops have a dozen people in them. Boys and girls begin from 9 or 10 years old. People usually work 12 or 13 hours a-day, viz., in summer from 6 a.m. till 7½ or 8 p.m., and in winter from 7 a.m. till 7½ p.m.; but there is not much done on Monday or Saturday.

Crinoline.

MESSRS. G. GRAY AND CO.'S CRINOLINE STEEL AND SKIRT MANUFACTURERS, POND STREET.

136. Manufactories of this kind in Sheffield, have hitherto been treated as falling under the Factory Acts, not indeed entirely, but as to those departments in which most of the workers, chiefly females, are engaged. A few weeks ago, however, and after my visit to the manufactory of the Messrs. Gray, the Sheffield magistrates dismissed a summons against a crinoline manufacturer in the town for exceeding the factory hours, on the ground that the manufacture did not come within the terms of the Factory Acts at all. They, however, granted a case to the superior Court on the point, but this has not yet been brought forward for decision.* Some explanation of the processes carried on is thus rendered necessary.

137. The manufacture consists of two branches; viz.,

(1.) The preparation of the steel by tempering, &c. carried on in a part of the works called the furnaces.

(2.) The covering the steel with fibrous substances, and making up the skirts, with incidental processes of winding, sewing, &c. Only very few females are employed here in the former branch, but many, some hundreds, in the latter. The Messrs. Gray employ thus at times as many as 400. Till lately it was only the departments in which the thread, &c. is wound or woven and the steel covered, as well as those in which sewing machines are used, which were considered as under the Factory Acts; but in the past year, 1863, the Factory Inspector notified that the making up of the skirts also fell under those Acts with the other processes, as being carried on within the same premises.

138. It may be well to state that the mode of covering the steel varies. In some kinds the cotton threads used for the purpose are interwoven round the steel in such a way as to form a woven fabric which will hang together independently of the steel, even if it is separated from it. In some, the thread is merely wound round the steel just as on a reel, in such a way that though it completely covers the steel with a fibrous surface, this surface is not an independent fabric, but is held together only by the steel which supports it. But both processes are performed by steam power on the same premises.

139. The furnace department, however, which is within the same "outward gate or boundary," and has been seen by the Factory Inspector, has never been treated as within the Acts. Night work takes place here sometimes throughout the night by relays of hands, sometimes merely by a prolongation of the hours of the day set. On my reading over the evidence of a boy, that he had worked through a night as well as by day, it was stated that this must have been accidental and without the knowledge of the employers. The shafts in the factory are securely fenced, though of the same kind as some which I have noticed in factories elsewhere, especially at Birmingham, as unfenced, and which it was stated could not be fenced, though accidents more or less serious from it happen there.

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* This case has since been decided, and the manufacture of a fabric covering the steel held to be within the Factory Acts.—J. E. W.

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140. Some of the boys in the furnace buildings work close to furnaces and in considerable heat, and it was stated by one of the men that there were none under 13, as they would be of no use, "it was hot " work, and they would knock up before half the time was over." It appears, however, that a few are under that age.

141. Another manufactory at Castle Mills, where the steel is rolled, was till lately carried on under the same firm with this, but the firm is now divided.

142. *Mr. H. Howard*, manager.—This is the largest manufactory of the kind in the town, and I know of but four others here. Until the late notice by the Factory Inspector, it was considered that the girls in the skirt department, *i.e.*, that in which the skirts are made up, could work what hours they pleased, and some did not come till much later than the factory hands, perhaps not till 9 a.m. No inconvenience has been felt from the change to the factory hours. If the women and girls do not come in time to do full work it is their loss. If they cannot do the work in the time we can put on more hands or get it done out. In the busy time we have more done out than in. The busy season is from the end of February till the end of July. Now, *i.e.*, before Christmas, we give none out, and have but a comparatively small number at work in. The women who take the work out employ girls under them in their houses. It would not pay them to do the work without employing girls. They take, probably, from six to a dozen girls from 12 years old upwards. By the time that girls get to be 14 or 15 or so they like to be working elsewhere as young women on their own account. The hours in these houses are no doubt entirely dependent on the amount of work to be done; but so far as there are nominal hours they are probably about from 8 till 8.

143. *Jeremiah Haynes*, age 12, in the furnace.—I tent reels on which the steel is wound, and fire up, *i.e.*, throw coal into the furnace when it is wanted. Always work here close by the furnace; it makes me sweat and my face wet, but it does not ever burn my clothes. (*Is hoarse.*) Have it very bad when I have it. There is a lump in my throat then, and it hurts, but does not hurt lower down. Catch cold when we've water throwed on us; but this work will be nice for winter. There are nine boys in here now, two or three a little younger than I am. Some do the same as I do; some wind or cut up. Our hours are from 6 till 6, but last week (December) we began coming from 7 till 7. Have an hour for dinner, but do not stop for breakfast; get that as we work. Am paid by Mr. Gray 4*s.* a week. When there is plenty of work we work a good many nights, three or four in a week, while 10 and 11 o'clock, and once worked from 6 Thursday morning till 6 Friday evening without stopping, except for meals, and came on again at 6 Saturday morning. Sometimes have worked here days and nights by turns. When we stay late we do not stop for tea, but get it as we work. There are about eight women and a girl, perhaps of about 15, in the furnaces here.

Went at 9 years old to work at Castle Mills at rolling steel for crinolines. The proper hours were from 6 a.m. till 6 p.m., but we made overtime about two days a week while I was there, which was not long; sometimes till 11 or so three nights a week, once till $\frac{1}{4}$ to 1, and sometimes I worked three shifts running, *e.g.*, a day, a night, and a day. When I was about 10 have worked two days and two nights running without getting any rest or sleep, except at meals. Was very sleepy, and sometimes have fallen asleep at my work. Was not beaten or found fault with for it, but the boys throwed water on my face to waken me.

Once the master's (man's ?) son kicked me, and the master hit him for it; and another time a man kicked me, and when my mother came to speak about it he said he would kick her; he "got the sack." There was another man, a Brummagem chap, who was always scabby, *i.e.*, agate of hitting on us, one minute a hitting on us, and another talking pleased to us. He used to get beer, and was drunk. The master used to call at him for acting so soft. One time when he was striking at me with his fist I tried to get out of the way, and my shirt nearly catched the shafting. If it had I should have been took round and killed. No lads were hurt except one, who got his finger off.

Worked also at another place in Green Lane, pulling out steel for the cutters-up. The hours there were from 7 till 7, days one week and nights the next.

Cannot read. Ran away from school to get to work, but would rather go to school now to get to learn to read. Cannot tell "reading" letters such as those (*i.e.*, my writing, J. E. W.), but can tell those in a book. Go to school always on Sundays. Have not heard of Abraham or the Gospel. The Bible tells us what to do and sich. There are somewhere about 30 pennies in a half-crown; am not sure; think about 32. Four times 4 is 8; 4 fours are 16. A king is him that has all the money and gold. We have a king. (Told it is a queen.) They call her the Princess Alexandra. (Told that she married the Queen's son.) The Queen's son is the Princess Alexandra. A princess is a man.

144. *Alfred Bishop*, age 11.—Mind the fires Only came to-day, but worked here before, but had to go away because I had my throat cut. The steel broke and flew, and cut me. (*Shows deep scar of more than three inches along side of throat.*) Bleed ? Yes, for half an hour. It was sewed up. I fell on the floor, and could not tell anything for five minutes. Oh, yes, I fainted. Was working nights then. Always worked nights, from 6 to 6, not on days.

Can read a bit. "D-o-g" spells "God;" can't spell "cat;" "t-h-e" spells "dra."

[Face grimed with black. Another boy of 13 said that he could only " read a little bit."]

MESSRS. COCKER BROS.', WIRE MANUFACTURERS, NURSERY STREET.

Crinoline steel and wire.

145. In one of the shops in which two young boys work there is a considerable amount of steam machinery and bands, the boys winding wire at one machine. In another room, where four or five young boys work, the side of a wire-drawing table, which ought to cover up the machinery, has come away and not been replaced. The boys have nothing to do with it; but as the machinery consists of many cog-wheels, and dangerous machinery is often found tempting to boys, it would be better safely covered up again. No accident, however, has happened here.

146. One boy (No. 149) gave an account of serious overwork elsewhere, and volunteered more than once the remark, that a boy upstairs (No. 150) had worked at the same places, and could tell me about them. I immediately afterwards questioned No. 150 upstairs, making no reference to No. 149, so that he cannot have known of my having questioned the first boy. I afterwards returned to No. 149, telling him what No. 150 said, but he repeated that he himself had worked as he had stated. The two accounts should be compared, as they differ in slight details; but from the manner in which the boy (No. 149) gave his statement, and the clearness with which he stuck to it after several questionings, coupled with the likelihood that if one boy worked the other could on that account be spared, my belief is that the statement of No. 149 may be taken as quite truthful as regards himself.

147. The manager in stating that he did not think that the boys ever made more than a quarter of a day over said that it might happen without his knowledge, the boys being under the men.

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148. *Mr. T. F. Cocker.*—The day's work is from 7 till 7, and Saturday till 3, with two hours for meals. Sometimes overtime is made till 10 or 12 p.m.; but I do not think it right that young boys should do that, so ever since last spring I have given directions that when this was done more boys should be put on, *e.g.*, three in place of two. Their work is chiefly scouring wire, and they can get on with it independently of the men.

We have other works for converting and melting steel. There are only two or three boys there, one a cellar boy, and one of about 18 who is learning steel converting. I am interested also in some tilting and rolling works. Work there goes on by night as well as by day when there is enough demand to need it.

149. *Martin Hefrin*, age 11.—Wind wire at a machine. Work from 7 a.m. till 7 p.m. Make a quarter of a day over sometimes, but never more.

Went at 9 years old to hardening and tempering crinoline steel at Tower wheel. In winter the proper hours were from 7 a.m. till 7 p.m., but we had to work over a good deal, and I didn't like it at all. For many and many a month we worked till 9½ at night every day but Monday. [Of course Saturday is also excepted.—J. E. W.] That reckoned a quarter over for each day. Many a time we used to work till 12 at night. Either once or twice—I cannot be sure which—I worked from 7 one morning all through the next night and day, and on till 12 the following night, and then was allowed to come late the next day. This 'ere D—— [the man for whom he worked.—J. E. W.] worked by the piece, and had so much a hundredweight, and he gave me and the other lad with him 3*s.* 6*d.* a week. He afterwards raised me to 4*s.* He let us have an hour and a half or two hours to sleep in the dinner time at night. There was only me and another man to keep the fires up, and we had done work by 12, say, and then had to get up at 2 a.m., and get the fires, &c. ready for the next morning. We never worked in the meal times. The man was very kind to us. I had to live very badly, and if I had no dinner he always gave me a bit. That boy upstairs (No. 150) can tell you the same. We worked there together, and did the same job.

Left that place for more wages, and went to a crinoline factory in Pond Hill, where I winded strip. There we worked from 6 a.m. till 6 p.m., and at another time from 12 till 12 the next day or night, changing turns each week. There we worked in us breakfast half-hour and in us dinner hour. We were forced to, whether we liked or no; we could not help it. Had, I think, ½*d.* for the breakfast half-hour, and 1*d.* for the dinner hour extra. Drew 5*s.* 10*d.* a week, my proper wages being 5*s.* Got the sack there because some lads were throwing about, and the man came in and said it was me.

They never took much trouble with me at school. Before I went to work, mother used to send me to school, but me and another lad used to pretend to go and didn't. But me and another what works here both go to Sunday school now. Can read a little. Know what the Bible is, but not what it is about. Can't read it, and don't know what they read out of it. Heerd saw (say) it was about apostles and prophets, I think. Heerd saw it was about Jesus Christ, and think that He was kind; but I don't know whether people were kind to Him, or killed or crucified Him, or if He is in heaven now. (In answer to more questions afterwards about Him, says.) Heerd talk about Catechisms, but don't know what they are, Sir! After people die their soul departs to hell or heaven. Heerd 'em axing who made us and that, but I never used to take much attention of them. God made us.

150. *James Dunagan*, age 12.—Rub wire with a rag. (Gives much the same account of his work as last boy at the same places of work, but varies in slight details.—J.E.W.) At Tower wheel worked a day and a night running about four times; never worked for longer together than that. Worked from 7 a.m. till 9 or 9½ p.m. three nights a week, viz., Wednesday, Thursday, and Friday, most weeks through the winter. In summer we worked days and nights, so could not work overtime, except a lad was away; then they axed us, and we did it. At the crinoline factory, at Pond Hill, worked over in the dinner hour and had 1*d.* extra for it. Did not work over in the breakfast half-hour. There is a boy downstairs (No. 149), who worked at these two places with me. Cannot say whether he ever worked for more than a day and a night together, but I never did. When I had done that I was off next day and night. Gave my wages to mother, and she gives me some spending money out of it. When I get more for overtime she gives it to me for myself to get a cap with, or something.

Cannot read. There are 20 shillings in a sovereign. 12 months in a year, and 50 weeks in a year. Yes; think it may be 52.

MESSRS. WORRALL AND HALLAM'S, CRINOLINE STEEL AND FLAX PIN, &c., MANUFACTURERS, ATTERCLIFFE ROAD.

151. *William Shorter*, age 10.—Here nearly two years. Roll crinoline steel from round into flat. Mind three rollers and sometimes four. Go home to dinner from 1 till 2. Get 3*s.* a week. We get caught in the bands sometimes by us waistcoats when we are throwing these there straps off. One young boy got his arm broke in throwing the band off.

Can read a bit (does), and go to school on Sundays.

152. *George Birkenshaw*, age 13, cellar-boy.—Can read a bit and write a very little bit. Have not heard of France. London is London. Don't know if it is a place or a town, or if Birmingham is.

153. *Josh. Lambert*, age 13.—Guide steel. Burned my wrist there with the crinoline; was shoving it into the roller and it broke. Burned my elbow before. Was putting the steel to harden and there was water on it. There was wet on the floor and it got on to the steel, and so made the stuff fly out and burn me. Should have wiped the steel first but I forgot. Would rather have this job than be where I was before, because this is hot and that was a cold job.

That was at a crinoline place, where I cut sheet-steel with shears. The steel cut my hands. Was also at tilting works. Worked nights at both from 6 till 6. Was at cutlery also.

Stop an hour for dinner, which my brother brings here, and half an hour for breakfast. Get 3*s.* 6*d.* a week; sometimes mother gives me 3*d.* There is no place to wash in here, but a tub for part of the work.

Can tell some of my letters. A stag is like a donkey but has horns; have heard mother say so.

Steel.

MESSRS. BEARDSHAW AND SON'S, STEEL AND SAW MANUFACTURERS, EFFINGHAM ROAD.

154. *Mr. F. H. B. Beardshaw*, son of the proprietor.—The work carried on here is steel melting, tilting, and sheet and rod rolling. All except the melting goes on by relays night and day, with two hours out of the 12 allowed for meals. We have also a file factory in another part of the town. Women harden the files, &c., and there are a few boys also. The hours there are from 8½ a.m. till 6 p.m., but many of the cutters have blocks at home and can take work with them to do there if they like.

For about a year we carried on some crinoline steel work, but do not now. Women were engaged

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in that in winding the steel, testing it, and in all sorts of ways. That work was very irregular, and sometimes they used to work on from Friday morning all through the night and on to the end of Saturday. Sometimes too if there was an accident to the machinery one day it would throw more work to be made up on the next.

We have a wheel here also for grinding saws, &c., but part of it we let off to independent grinders. Those who work for us pay no rent. There used to be no windows in, or rather they were all broken out but lately we have had windows put in one part as the men complained of the cold. The windows have been fixed so that they will not open, with a view of preserving them better from risk. Now the men complain of this.

155. *James Baker*, age 10.—Lift up at rod-rolling; the rods are hot. Work from 6 till 6, days one week and nights the next. Have twice worked a night as well as the days, because a lad was wanted in the other turn. Go home an hour to dinner. Get 6*s.* a week. Worked here six months ago, and went away because there was no work for me, and have only lately come back.

The burn on my thumb was done at work of the same kind at some other works; it was wire flattening. The burn has not healed since it was done more than six month ago, but is always like you see it now. Can read a bit.

156. *Thomas Darnall*, age 15.—Am a cellar-boy. Have been so at this and other places for five years. Sometimes a melting takes half an hour or so longer, but usually I work from 6 a.m. till 5½ p.m. On Saturdays we begin at 3 a.m. and I have to get up at about 2½.

Can read, but not write so very well. Go to Sunday school sometimes. 11 times 11 is 110,—is 121.

MESSRS. WILSON, HAWKSWORTH, ELLISON, AND CO.'S, STEEL MANUFACTURERS, CARLISLE STREET.

157. These are large new works, with good accommodation for the workers. The warehouse or room in which the females are engaged in whetting cutlery, rubbing off grease, wrapping up, &c., is very airy and cheerful. The cellars, also, beneath the melting furnaces are the most airy that I have seen, having a passage to the open air at each end, which tends to cool the air and seems a great advantage, and one which by proper arrangement might be obtainable in all cases. A boy of 13 was in his cellar patting some clay about in the dinner hour.

158. *Mr. T. B. Hawksworth.*—We convert, melt, and roll steel here. We are also cutlery manufacturers or rather merchants, this work being done for us by people in the town and country round who work for other manufacturers also.

Of late, indeed since we opened these works five or six years ago, owing to the state of trade, ours being chiefly American, we have had no occasion for night work. If trade were better we probably should, as night work is usual in like branches of business. The boys are employed by the men, and work chiefly at taking out metal from the rollers and straightening it. The females are in the warehouse.

We have tilting and forging works at Beelywood, where only water power is used. There the hours of work consequently depend upon the supply of water, and the hands work in the night or day just as it happens. It may be that they begin at 2 or 3 a.m. and work as long as the water lasts, but they would seldom do so for more than 12 or 13 hours. If it came to 15 or 16 they would get a relay. If they could not get a relay conveniently one set might have to work rather longer than they otherwise would. The work would seldom go on through the 24 hours if it could be helped, as the machinery is not suited for it. The anvils and hammers become heated. Newer machinery, however, for the same purpose will work and elsewhere is worked night and day. The workpeople there live on or near the premises and are ready whenever they are wanted. They are likely to know beforehand from the state of the water when this will be.

MESSRS. W. AND S. BUTCHER'S, STEEL MANUFACTURERS, PHILADELPHIA WORKS.

159. *John Edwin Saville*, age 14.—Cut scrap metal at a machine. Work from 6 till 6. Make overtime sometimes till 12, sometimes all night. Do this if a lad is poorly. When I leave at 12 another comes on and makes overtime to fill up the other half of the turn. Have got a scar on my leg here where a sheet of metal slipped and cut me. Have got burned too. Go to school on Sunday when I have got any clothes to go in.

160. *Joseph Chaworth*, age 10.—Work at the rollers. Don't know my Christian name, or what that means. Mother calls me Joseph.

> [The proprietor expressed surprise that there were boys in the works so poorly taught, and said that if he had known that the boy (No. 159) was kept from Sunday school by want of clothes they should have found him clothes to go in.]

Steel and tools.

MESSRS. PEACE, WARD, AND CO.'S, STEEL, FILE, &c. MANUFACTURERS, SAVILLE STREET, EAST.

161. *Mr. Alfred Peace*, in the warehouse.—The work includes the melting of steel, and the making of files, saws, table and spring knife cutlery, edge tools, and loom springs, with grinding of the tools in a wheel.

The boys are employed by the men. It is very rare for the steel melters to make any overtime. There are two cellar-boys, aged about 13, and they make lids and stands for the pots; the latter are made by men. Only about seven females are employed in the works, all grown up. Some are in the warehouse and brush and wrap up files, and others in a shop scour the files with sand, which is heavy and dirty work and more suitable for men. There is no washing place which the scourers could use, but there is one for the warehouse women. A girl sometimes blacks part of the work.

162. *John Walter Dakin*, age 11.—Lay on some stuff to the files before they are hardened and put them in the fire. Work from 7 a.m till 7 p.m., not longer. Sometimes come at 6 a.m.

Was never at school. Cannot tell the letters.

> [Ill clothed and pale. Works in a small forge like shop alone with his father.]

163. *Joseph Gavin*, age 13.—Have been a file cutter two years; work here under father, from 7 till 7, sometimes till 8.

Ironworks.

THE PARK GATE CO.'S IRON WORKS, NEAR ROTHERHAM.

164. *Mr. J. Taylor*, assistant manager.—These have long been the largest ironworks in the neighbourhood. They employ about 1,300 persons. We make all sizes of iron used in the trade, from the

lightest up to armour plate and the heaviest work, and particularly a large quantity of railway iron. We do not want boys under the age of 12 or 13, and there would be no objection to a law preventing any boys under 18 from working more than 12 hours in the 24. It is not right that they should work more, as they sometimes have to do to make up another shift. Such a regulation might oblige the workman who undertakes the work to keep a spare boy or two.

It would not be possible for the boys, to have stated times for meals, nor could as much as an hour be spared at any one time, even if the time of day were not specified. The "heats" (metal) must come out when they are ready, or they would be spoiled; and the boys must be there to help. Any fixed times for meals would cause great hindrance and loss. The heats could not be so arranged as to allow of any regularity. The quality of the iron may make a difference as to the time of heating, the shape into which it is put a difference in the time of working, and hindrances may arise. That stopping of the engine just now for 20 minutes owing to something wrong with the pump, would very likely be the cause of spoiling some iron. The boys, however, get frequent intervals of 20 minutes, or perhaps half an hour between the heats, and take their meals in these. Such an interval is seldom more than half an hour.

A prohibition of night work by boys would increase the cost of labour considerably in those departments in which they chiefly work, *e.g.* rolling. I cannot say whether these items would be sufficient to raise the entire cost of the articles produced enough to injure the trade, if all works were under one law. It would not do to allow the younger boys to work only by day as this would throw constant night work on others in the alternate shift, and this would not suit their health. I cannot say up to what age boys could be spared from the night work, but I will put it thus, viz., that it would do boys of from 12 to 15 years of age less harm to work in the night shift in alternate weeks on the present plan than it would do boys of from 15 to 17 to work always in the night shift.

[Mr. Sanderson, the general manager, expressed a general concurrence in the above views stated in his presence.]

165. *George Gardom*, age 12.—Pull down iron at the rollers. My hand is wrapped up because the iron burned it. Work days and nights in alternate weeks. Sometimes work a day and a night both. When my butty (boy in other shift) is badly he axes me to work in his shift. Have not done this many times. Like being on days best, because I get 6*s.* a week then and only 5*s.* when on nights.

Can read and write but not sum.

166. *John Greaves*, age 12 (?)—Don't know how old I am. Scrape scale from bars. Sometimes work a day or night shift over, *i.e.*, besides my own, sometimes half a one.

"M" is "W." Was at day school till a year ago, and go to Sunday school.

MESSRS. G. AND J. BROWN'S, ROTHERHAM IRON WORKS, ROTHERHAM.

167. *Charles Kay*, age 15.—Lift hot bars at the rollers. Work from 6 till 6 on days and nights in alternate weeks. Work a turn or half a turn over about once a week. Am most tired when working on nights. Get to bed then at about 7½ a.m. and sleep while 5 p.m. or as long as I can short of it. When working on days, get to bed at about 8 p.m. and rise at 5½ a.m. When I am on nights, Monday is the worst because I have been to bed on Sunday night, and cannot lie in bed on Monday, so I am up for 24 hours running. It is very seldom as ever I do go to bed on Monday then.

Like being on days best. When I was in another part of these works I had to work always on nights. The head man always worked in the day turn, and the other man, who was properly a furnace man, and not such a good roller, always in the night turn. I was not such a good catcher as the other lad, so the head man would not have me to work for him. The burn on my arm is from the iron.

THE STAVELEY IRON CO.'S WORKS, STAVELEY.

168. *Mr. Daniel Parker*, in the office.—Work at the blast furnaces goes on day and night, but only men are employed in connexion with them. The foundry hands work only by day from 6 till 6, as do also the fitters in the machine shop, and the persons engaged in drawing patterns and shaping them in wood as models. In the foundries some of the men are paid by the piece, *i.e.* at the rate of so much a ton for what they turn out. This is done where castings of the same kind are made day after day, *e.g.* pipes, so that what the men can do in a day is easily calculated. Where this cannot be done, owing to the castings being of different kinds, they are paid by the day. Where the work is piece work the boys are in the employment of the men, and their time of work is more irregular and more liable to overtime than that of the day workers. Piece workers please themselves as to the amount of time which they take for meals. There is again a third kind of work called "set work," *i.e.*, when a certain quantity is set to be done in a day.

There are about six other iron works in the neighbourhood of this place and Chesterfield, several with blast furnaces, but these works here are some of the largest. A triangle drawn from Sheffield to Eckington and Chesterfield would include most of the Derbyshire iron working district. The system of work as to hours, &c. is, I believe, much the same as in the corresponding kinds of work here.

169. *Samuel Thompson*, age 12.—Riddle sand in a foundry. Begin at 6 a.m. and leave at 6 p.m.; sometimes at 5 or 4. Sometimes make a quarter or half a day over, *i.e.* till 9 or 12 p.m. Have worked from 6 a.m. till 12 p.m. for a fortnight on end, could not do it any more, it was so late at night. Live half an hour from here. Get 1*s.* 2*d.* a day. Do not get any of the extra wages for overtime for myself. Saturdays we have to come at 2 a.m. and give over about mid-day. Have time for meals just while we eat them, but no more. Can read well.

170. *Samuel Fletcher*, age 13.—At moulding in another foundry. Have not made much overtime in this. It is day work. Have half an hour for breakfast and an hour for dinner. Have sometimes begun work again before the dinner hour was over but not very often. When under a man who worked by the piece in another foundry here, I have made a quarter of a day over three nights in a week. Can read and write.

171. *Thomas West*, age 13.—Fettle, *i.e.*, knock sand off the iron with a scraper. Work from 6 a.m. till 6 p.m. Sometimes make a quarter over till 8 p.m. not later. Have half an hour for breakfast and an hour for dinner. Get 7*s.* a week. A lot of other boys do the same work. Can read, write, and do sums a little.

MESSRS. W. AND G. DAWES' IRON WORKS, MILTON AND ELSECAR.

172. *Mr. Richard Jukes*, general manager.—Only men work at the blast furnaces. The puddlers have a few boys to sweep up for them, &c. Both these branches of work go on day and night in the usual

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way. There are some boys in the foundries and apprentices in the fitting ships. Both these classes of hands work by day only. Most of the boys are employed in the rolling mills. Only the fitters are paid by the firm. The rest is contract work and paid by the men who contract for it. At Elsecar the work is of a heavier kind and there are not half so many boys employed there as here at Milton. The system of work is the same in other iron works in the neighbourhood. These are about the largest, the two works together employing perhaps 700 persons.

173. *George Shepherd*, age 12.—Work at the rollers. Was turned 8 when I came here. Used to lift up the door of a furnace at first. Stood about a yard from the furnace; it was very hot work. Have always worked days one week and nights the other. Have about half an hour for breakfast and the same for dinner. Have worked a day and night running three times. Did not go on again next day. Have also worked on till 12. Last Monday worked till 9 p.m., *i.e.*, 15 hours. When some lads don't come the others make up the work between them. Take home 10*s.* a week. (Quære, including his brother's money?) Mother gives me 2*d.* for spending money, but does not put any in the bank for me. The men are kind to me. Get burns on the arms from the hot metal.

Know the letters but cannot spell; know the the figures separately, *e.g.* "1" and "5," but cannot say what "15" is.

174. *Walter Shepherd*, age 10.—Was going in 8 when I came here. Pulled up the door at a furnace at first. Work days and nights in the same way as my brother George (No. 173). Once they sent and called me out of bed at 12 at night, when a little boy got burned. Worked on till the next night. Have worked on till dinner time next day after working on the night turn. Get tired when I work like that. Don't know what I earn. George takes the money to mother for me and all. My eyes are sore. (Look weak and subject to sties.—J.E.W.)

God is up at sky. Have heard of Moses in the Bible. Adam and Eve lived in heaven.

175. *Markham Morris*, age 12.—Heave up at a roller (in another part of the works). There are about 12 boys in each turn there, and rather more in this (first mill). The work tired me when I began, *i.e.*, two years ago, but I can do it now. Have worked half a turn over four or five times in a fortnight, but only once worked two turns together. Am sometimes a week, sometimes three weeks or more, but never over a couple of months without working over so. It all depends upon how often there is a lad short. Have his money then. Get 5*s.* a week. Get sometimes half an hour, sometimes an hour for dinner. Like working nights the best, because I have not to work in the last turn on Saturday and so get done, and get the reckoning sooner.

176. *William Reed*, age 12.—Pull up a door at a furnace in the Elsecar works, not here (Milton). Two or three younger than me do the same work days and nights in turns in the same way. Have had to get up the furnace on Monday for the puddler's under hand, who ought to have done it himself, and then to work my own night turn as well. He paid me for it. Have worked two turns together four or five times. Get 1*s.* 1*d.* a days.

177. *Frederick Brook*, age 14.—Make cores with sand in the foundry. Hours are from 7 a.m. till 6 p.m. Make overtime about once a week, sometimes till 8 or 9 p.m. the latest has been a ¼ to 10. Have half an hour for breakfast and an hour for dinner. The Queen is Queen Bertha: yes; is Victoria.

[Bare shoulder showing through large tear. His father is foreman in the same shop.]

178. From what I learned at some iron and steel works which I visited in the neighbourhood of Mexborough, and as to others near, they all seem to correspond closely with works of the same kind, of which accounts are given elsewhere.

179. At some small steel works at Swinton (Wilson's), in this neighbourhood, I found a boy of 7 years old who "picked scrap," though he is only occasionally employed. A boy was killed here by being drawn through the rollers. He did not work there, but had only "come in to clatter" with others, and falling against the space between two adjoining rollers was drawn in. Loose boards are now placed at this part, but they are not a sufficient protection.

MR. J. ASKHAM'S, TABLE KNIFE MANUFACTURER, BROAD LANE WORKS.

Cutlery.

180. The works are cramped, and in a neglected, untidy state. In one very small shop I counted 10 panes broken, three stopped up with paper, and the remainder brown with the "sauce," glue, and emery thrown off in the course of the work. In a gloomy bone-cutting shop heaps of rough bones were lying. In a hull on the same premises used by fork grinders some bands cross very awkwardly at the height of the knee, covered by a box unfixed, which I nearly knocked off in stepping over. A fan has been put up, but only fitted to two out of all the troughs. In one dark room were a man, his wife and baby, and four young children, one just 7.

181. *Thomas Phillips*, adult.—Saw bones for scales at a circular saw driven by steam. It is a very dangerous job; you can't help cutting yourself. You daren't usually put young boys to this job; they would be laming theirselves. The bone is held in the fingers, and you could not push it with a gauge, except for certain articles. I began when I was 14. This box is put to keep the dust out of the eyes, or you would cut your fingers off. There is more dust where the bone is cut dry; ours is damp. It is boiled first for the sake of the fat that comes out. You swallow dust, but bone will disgest. It hurts the breathing of some people.

182. *Richard Mittam*, age 14.—Saw bone at a steam circular saw. Have been at it four years at this and another place. Have cut my thumb and two fingers three or four times at it. The longest time that I was away for a cut was two months. Very often have a cough; think it is from going out in the cold. Used not to have it. Work for a man here who gives me 7*s.* a week. Work on Monday from 8½ a.m. till 5 p.m.; Tuesday from 8½ a.m. till 6 p.m., and longer later in the week, but not longer than from 7 till 7, and on Saturday till 3. Have an hour for dinner. Where I was before the hours were in much the same way, but rather longer.

Cannot read or spell at all.

183. *Emma Cheetham*, age 7.—Have worked here twelve months with my father. Am just 7. Do odd jobs and run errands. Come at 9 and leave at 7, sometimes 8 p.m.

Was never at school.

184. *Albert Spinks*, age 11.—File wood knife handles. Work from 8 a.m. till 7 p.m. Where I was before I worked from 7 a.m. till 8 p.m., and sometimes till 9½. Have an hour for dinner here. Get 2*s.* a week.

Don't know the letters. Was never at school except on Sunday, and don't go to that now; father or mother don't tell me to go. Was never inside a church or chapel.

[Very ragged. Has a cough.]

185. *Joseph Sellar*, age 13.—Drill holes with a fiddle, and push the plate of it against my breast; it does not hurt me.

Never at school since I was 9 years old.

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MR. J. SHIRTCLIFFE'S, IVORY, PEARL, AND TORTOISE-SHELL CUTTER, WEST STREET.

186. The fact that the greater part of the manufactory is let off to small employers or independent workers in several different trades may account in some degree for its bad and neglected condition. In several parts the shafts, bands, &c., are awkwardly placed, and need protection, particularly in one or two shops where some females work. Boards are put up as guards in some places, and, as it was stated, wherever the proprietor thinks that there is danger; but his judgment on this point must be rather loose. In two or three places a slight want of attention on my part while passing to reach the workers, or while speaking with them, might have been serious to me, as, indeed, I was warned in a hull.

187. *Mr. Robert Shirtcliffe*, son of the proprietor.—We let off the greater part of our works to persons working in several different trades, *e.g.* grinders of different kinds, spring and table knife cutlers, pearl cutters and fluters, ivory carvers, turners, silver buffers, &c. A small master, occasionally a woman, will take one or more of the rooms, and employ the workers in it. One manufacturer takes six rooms of us. Including the wheel, there are probably from 250 to 300 persons on the premises, but I cannot say accurately.

We open the works at 6 a.m., and in winter generally at 7½. We close them at 9 p.m., and have great trouble to get the people out then. Some would work all hours if they were allowed to stay; but then they do not come regularly. I have seen many coming in at 9 a.m., even when they are busy.

Wherever we find a dangerous place we put a board over the machinery. Bone and ivory are worked dry, and cause a good deal of dust. The pearl is cut by circular saws, the tortoise-shell by hand.

188. *Sophia Cockin*, adult.—I rent this room, and employ a few girls in it on cutlery. I began cutlery work at 6 years old. They lifted me up on a stool to reach my work, as I was not big enough to get up myself. My lass, now dead, began cutlery when three weeks turned 6 years old. Bless you! you'll find little ones at it up and down now, some, I dare say, nearly as young as I was. The trade is up and down so that people are obliged to put their children to it as soon as they can bring in anything. There's many a little nattling job that little ones can do in it.

When I first began I and my sister worked for mother, and then in a shop like this for my uncle. Even then he would have us up at 5 and 6 in the morning, and keep us at work sometimes till 8, but many a time till 10, 9, and 11 at night. At first, when at work late, I have fallen asleep with the work in my hand, and mother would hit me over the head to wake me up. When I were a lass I have many a time worked all night on Friday; and after I grew up and married, for years I never went to bed on Friday night, because I was slaving for my children. On other days I have often worked from 4 and 5 a.m. till 12 at night.

I have a cough (*she had coughed several times*), and a pain in my chest. It is from the dust made at the lathe. I am very tired of the work now but am obliged to keep on at it. It is easier for the bones now that we use steam power, but it is worse for the chest, as so much more dust is made. Working the lathe with the foot I should sweat even at Christmas on the coldest day with frost and snow on the ground.

The girls don't get caught here in the shafting, though we hear of such things at some places. I have been very careful about machinery ever since I was a girl 9 or 10 years old. We girls in some works of this kind were playing at hiding, and one about 14 years old hid beside a drum in a wheel not then working, and it was started and crushed her to pieces. They had to pick up her bones in a basket as they found them, and that's how they buried her. Girls are soft, giddy things. That one there, now about 14, is a dragon for getting into danger, and I have great trouble with her. If I was not looking she would be putting her foot on the shaft, very likely; and once she sat down upon it, just to see how it felt when it was set agate.

The master does not have the shop cleaned; we must do it ourselves. But after working so long we are too tired. That heap of bone dust (a bushel or two) in the corner has been gathering for many a week. It is three weeks since we swept the rest of the shop. The dust is swept into the corner.

189. *Margaret Jane Sanderson*, age 13.—Work for last witness. Was nearer 7 than 8 when I began cutlery. It was in a shop where only a man and his wife worked. Come to work here usually at about 8 a.m., sometimes at 7 and 6; and work till 8 p.m., sometimes till 9 and 10. Have an hour for dinner and half an hour for tea. Go to the frame (lathe) there to glaze.

190. *John Lovatt*, age 9.—Work here (in another shop, J. E. W.) under my cousin at cutlery from 7 a.m. till 7 or 8 p.m., and till 8½ on Fridays. Have been at the work three years. Fell under the shafting there and broke my leg. Was laid up altogether 14 weeks with it.

Cannot tell any letters.

191. *Henry Slater*, adult.—What my cousin (No. 190) says is quite right. Some begin work very near as soon as they can crawl. Let him have breakfast, an hour for dinner, and drinking at 4½. He earned 1*s.* a week when he began, and now gets 3*s.* He is about as sharp as a Sheffield whittle when he likes.

192. *Ellen Watson*, age 11.—Have worked at cutlery here two years. Have the same hours as the boy (No. 190). Have worked till 10 p.m., but not very oft.

Know the letters, but cannot spell. Do not go to Sunday school.

193. *William Watson*, cutler.—There are many a score and hundred girls in Sheffield at the same work as my girl (No. 192); some from 6 or 7 years old. We're forced to put them to it. There are more girls in proportion now than there were at the work, because hardly any will let their boys come to it because it is got so low.

194. *William Turner*, age 12.—Have worked at cutlery for father seven years.

Don't know anything about the Queen or England. Don't live in England. Think it *is* a country, but didn't know before. There are six days in a week. There is another day; altogether it makes (*after a long pause*) seven days.

> [His father said that it was true that his boy had worked for him seven years, but that though he flogged him to make him go to school, the boy "*would* come to the "shop." A girl of 11, with fuzzy untidy hair, and her dress torn leaving her shoulders bare, had worked at cutlery for her uncle three years.]

195. *John Leedham*, age 14.—Cut pearl scales at a circular saw. Am very careful, but cut my hand at it. Work from 7 till 7, and on Fridays till 8. Throw the band off with a stick.

196. *Edward Jannet*, age 16.—Now apprentice to a table-knife grinder at Rodgers' wheel. Worked at cutlery before at a small place. There was only one boy besides me. I war but a little 'un when I went; must have been about 8 years old. There were no regular hours. Sometimes went at 6 in the morning

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and worked till 9 at night, and on Fridays sometimes till 9½ to finish for Saturday, but that was the latest. Did not work so late just at first till I got into the work, but it was not more than a month before I did. Did not work much at the beginning of the week; may happen half a day on Monday, according to the work. Had about 20 minutes for dinner, and took it there, and about a quarter of an hour to us teas, and breakfast about the same or while we could swallow it. Took tea and sugar and made it hot there. Got paid according to what I did, but before I left used to look for 6*s.* a week, which master gave to mother, and I had 1*s.* and sometimes 1*s.* 6*d.* spending money besides.

Have not been at Sunday or night school except once or twice, when I went to Sunday school because they were going a trip, and I went the trip by train. Can tell any letters, but not spell them or tell any figures. Do not know the Queen's name. Have heard of Queen Victoria, but did not know that that was the Queen's name.

MESSRS. UNWIN AND RODGERS, CUTLERY MANUFACTURERS, PENISTONE ROAD.

197. Some of the work-places are cramped, with dark and inconvenient approaches, but they are, I was informed, considered good in comparison with many cutlery work places. In one shop where power is used the shafts are open and unsafe, at any rate for a woman who works at times with her skirts close to them. A band is thrown across, when needed, from one bench to another, crossing at about the height of the knee. One of two twin sisters, aged 16, who work with their father in a cutlery shop, stated that she had worked as long as from 5 a.m. till 9 p.m., but usually only as long as she pleased.

198. *Mr. John Unwin.*—We reckon 10 hours about the average day's work. The engine runs 12 hours, stopping an hour for dinner, but much of the work does not depend upon power. The works are open at 6 a.m. and close usually by 9 p.m., though they are sometimes open till 10 p.m., but all must be clear out by then. The night watchmen fires a pistol at 5 a.m. and 10 p.m., and any person found on the premises between those hours would be considered as being there for an unlawful purpose. The men work by the piece and come and go when they please. Some will come for only five or six hours in a day at the beginning of a week, and for 15 at the end. But most seem to know very well what a day's work is, viz., 10 actual hours, and few as a rule average more. One man, who works an expensive piece of machinery, a hammer, and ought to make 30*s.* a week at it, is now keeping it standing, He has not been here at all this week, and it is now Friday evening. This keeps back some of the forgers, and they again the grinders. Generally speaking the blade makers come the first thing in the morning and leave early; the cutlers come late and like to work at night.

A limitation of work to 12 hours would only touch Friday, and perhaps Thursday, as I scarcely know of men making lads work more than 12 hours except on those days, if then. Boys may certainly be tempted to work over at times, because, though strictly speaking they are paid only by the day, the men set them a certain amount to do in a day, a kind of piecework in fact, and if the boys do more or work longer the men give them something for themselves, "spending money" as it is called. Boys make a good deal of money in Sheffield in this way. Just before Christmas all like to work longer, and in Bull week they will work all night. There is no limit to their work then.

We have, perhaps, about 150 persons directly or indirectly in our employment here, and about 100 at other works of the same kind in the town. The hours and mode of work are the same there as here. We employ females in the warehouse work but hardly any in the shops.

But besides this a large number of persons work in our wheel here as grinders though quite independently of us and not under our control, except so far as our supplying the power. We let off I believe nearly as much power to grinders as any private wheel. Most of the wheels in the town are connected with a manufactory of some kind. Wherever there is much power it is usual for a manufacturer to let off part to other trades. We have about 70 troughs in our wheel, and each of these is occupied by two or three persons, occasionally more or less according to the kind of work.

There are, however, several public wheels independent of any manufactory, such as the Union and the Soho. Where a wheel is independent of a manufactory there is usually an overseer or agent to let the troughs and collect the rents, and of course an engine tenter in charge of the engine, but no person who superintends the actual management of the place.

Our works are a very fair ample of cutlery manufactories in the town generally, and their system of work, as we make cutlery of most kinds, *e.g.*, table-knives, all kinds of spring knives, razors, scissors, and also grind these as well as saws and files. There is nothing in the nature of the work itself which would make a difficulty in requiring regular factory hours, though it might perhaps be said that it was interfering with the liberty of the subject.

The short day on Saturday has been becoming very general in Sheffield, especially in the last year or two. Work used to go on then till 8 p.m., and has gradually been shortened an hour at a time up to 4 o'clock, and in some cases much earlier. The railway not running goods after 3 p.m. on Saturdays has been a great cause of this.

199. *Samuel Hawley*, cutler.—My brother and I employ all in this shop, viz., four boys and a woman. The woman glazes and does everything just the same as a man. We do almost everything by power now. Boring the holes was formerly done by pressing the tool against the breast, which was painful and injurious. By using power this is avoided, and a person can do four in the same time that it took him to do one.

With glazing the effect of using power is not so good, as so much more dust is caused. If you had come in here three-quarters of an hour ago when three or four of us were at the same sort of work, you could not have seen across the place for it. The bone dust smells very much, and lies more on the stomach than the metal dust, which our work also makes, but is not so injurious. The bone cutters here consider the smell healthy. We smell it awful when we come to work on Monday morning, *i.e.*, after being away for Sunday.

200. *Frederick Hawley*, age 12.—Do cutlery work, glaze, &c.

Went to school for a year, but had to come to work when mother died. Can tell some of the letters, not all. Can't tell what four times 12 is, (but knows twice and three times 12.) Don't know how many weeks or months there are in a year.

> [This, the youngest of four boys, brothers, working in the same shop, was supposed to be the "best scholar" of the lot, being the only one of five brothers that had ever been to school.]

201. *James Harrison* and *Walter Deakin*, table-knife hafters.—We have worked for many years in this branch of the cutlery trade. It has been for some time in a very depressed state. Some years ago there were 1,300 men besides from 60 to 80 women, and 400 or 500 boys and children engaged in it. We have lately taken a census of it and find that there are now about 500 boys and girls under the age of 18,

most of them boys; about 960 men, at the outside 1,000; and perhaps 100 or 150 women, chiefly working with their husbands in shops. There are plenty of children in it as young as 8, but few younger. The most usual age for them to begin is about 8 or 9.

The work is carried on partly in large factories, partly in small factories and shops. House or garret work has been decreasing for the last 20 years, and is now almost gone. Men find that it answers better to work in places where they can have the advantage of power. The proportion, however, of those employed in large factories, and those employed outside varies with the state of trade, the tendency of bad trade being to discourge large masters from keeping workpeople regularly employed on their premises. Perhaps at the present time about half work in small shops up and down the town. But in many cases some of those who work in factories are really outworkers working on their own account or for other masters. We should call a place a factory where as many as ten or a dozen work.

In one or two of the best factories the hours are regular and moderate, but generally speaking there are no fixed hours of work, the gates opening at 6 and closing at 9, sometimes 10 p.m. Taking the trade through, table-knife hafters generally work 14 or 15 hours a day, and are at the same time probably the worst paid class in the town, not making on an average, after paying all expenses, more than 16*s.* a week. Table-knife hafters have to pay the manufacturer 1*s.* a week for the use of their bench and power, as well as find their tools and pay several other items for materials used, *e.g.*, lead to put in balance handles, rivets, &c., which will often cost more than the manufacturer allows for them. The whole outlay off the wages for these things comes to, say 20 per cent.

To get money for these purposes to enable him to start a week's work a man has to put by part of his previous week's earnings, or often if he cannot do that, has to borrow it of the master, or raise it in some more objectionable way.

The poorness of the pay seems connected with the length and irregularity of the work hours. In 1843, the hours were regulated by the trade and limited to 10 daily. We are confident that manufacturers sent away then more goods in proportion to the number of hands employed, than they have since that rule was broken down, as it was after the panic of 1847. Men worked regularly and did not waste time as they do now. We should say that there is more loss of time in Sheffield than in any other town. If one branch of work is behind it throws another out. Thus the grinder must wait for the forger, and we for the grinder and scale-cutter. Hence, when we want to be at work we often have to be sending notes about for different parts of the material. Manufacturers would be in a position to prevent this loss of time from waiting for materials much better than we can, if the practice were for them to provide the materials. But they probably would sooner not have to keep the stock which would be necessary.

The shorter hours were much better for the workpeople too, as they could get out in the evening, and have a game at wickets or exercise if it was summer, whereas now they never know when they have done. Also before we had this regular 10 hours work it was but few who could afford to dress so as to follow the funerals of members of the society, which members were requested to do, whereas after the change they followed by hundreds. There is less necessity for irregularity of work than formerly, as there is now less distinction than there was of home and foreign seasons, which form the two halves of the trade.

Our trade has tried hard to re-establish our former system of short and regular work, but we are quite unable to do so. It would not, perhaps, do to limit men's work by law, and we might not like it ourselves, but it is desirable that the work of the young at least should be so limited, and we should like it for our own children.

It is true that it would be less easy to carry out a law of this kind in small shops than in factories, and in factories such as those in Sheffield, where nearly all the children are employed by the adults, than in factories such as those in Lancashire. But we think that it might be done not only in the factories, but even in the small shops and homes, say, by putting on a small fine, which was the way that we enforced our rule. We do not think that it would be thought more hard in a case of working at home than in a factory. There are plenty of people here who would let it be known if the law was being broken. But if it were impossible to carry out such a law effectually in the small places, we do not think that this would be felt as an injury to those who work in other places. In one of the largest and best cutlery factories, where there is a rule that the works shall close at an early hour, the men never grumble because others can work longer elsewhere.

The spring-knife cutlery trade is very much like ours as to system of work and workplaces, but the proportion of boys is greater. Table-knife hafting includes the hafting of forks as well as knives.

Many factories are quite unfit for workplaces. More have ventilation than had formerly, but many are very deficient in this respect, as well as dark and crowded and shamefully dirty, and also dangerous from exposed shafts, bands, and drums. There should be some means of seeing that they were put in a fit state, broken windows mended, rags and dirt cleared away, and machinery boxed. It is not possible to fence off machinery entirely as some bands must be left open, but a great deal might be done. We knew a man who was caught by his neckhandkerchief in a band and hanged dead, and a woman who had her dress caught in a shaft and stripped clean off her back, both in cutlery work. The daughter of one of us (J. Harrison) had her dress stripped off in the same way by a shaft in a cutlery shop twice in one day. The work was polishing wooden knife handles.

The work, table-knife hafting, was one of the healthfullest in the town, and men lived to a good age, but since steam has been so much in use, *e.g.* for glazing the hafts, &c., it is quite altered owing to the amount of dust which is caused. People ask, "Where are the old men, now?" You may see men as white as snow from the bone dust, though caused, not by themselves, but by others near, and coming out coughing and spitting from it. Last winter I (W. Deakin) was working amongst others in a dusty place and it nearly killed me. This winter I am at another place where I am not exposed to others' dust, and I am quite different,—not like the same man. Fans would quite remove all this dust just as well as in the grinding wheels, and the men want to have them but cannot afford it.

Apprenticeship, which was the rule in all trades in Sheffield, is now to a great extent done away with, as it is in ours, owing chiefly to the greater cheapness of our work which makes a man less able to keep apprentices. In one way boys get the benefit of this, as they earn more money earlier, and a man must pay them their worth or some one else will and tempt them away by giving more. But, on the other hand, boys are often kept at one part of the work instead of being properly trained in all, and thus do not become properly experienced workmen. The boys are generally kindly treated by the men.

Many table-knife hafters cannot afford to dress their children well enough to send them to Sunday schools, and many even of the adults are extremely ignorant.

202. The above statement was afterwards concurred in by two other table-knife hafters (James James and William Wales), and they, with the only one of the above witnesses then present (J. Harri-

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son), estimated that probably as many as a third of the adult table-knife hafters could not read or write. It was also stated that out of the 10 boys, of ages from 10 to 17, in a factory in which one of the witnesses worked, only two could write their names, but that as many as a third could read.

203. *Mr. Francis Bownes*, secretary to the spring-knife cutlers.—The chief change that has taken place in our trade in the last 20 years is that the great bulk of it has gradually come to be done in regular factories instead of in private dwellings and small shops as was formerly the case, and that the earnings are lower. The advantage of working with steam power is what has chiefly led to working in factories, but I do not think that it is the increase of factories and the improvements in them which have sunk the price of labour. There is still work in small places in the town, and in the country district round. In the latter, people still work in their dwellings or in small shops attached, or in their garden, &c. Some work will probably always continue to be done in this way, as the price of the labour has now sunk so low that even the use of steam cannot well sink it lower. Nearly all the work out of Sheffield is done in villages within five or six miles of it, especially Wadsley and Stannington. A little is done in London and Salisbury, but there are no spring-knife cutlers in any other part of the kingdom, except mere jobbing cutlers. The trade is about the largest in Sheffield in point of numbers, except the file trade. The number of persons engaged in it remains much as it was. According to the account taken in 1862 and delivered at a trade conference, since which time there has been no change, there were then between 2,200 and 2,300 men and several hundred boys,—somewhere I think between 500 and 900,—with a few females. Sixteen years ago there were about 2,400 men. The boys are from 9 or 10 years old up to 21, but as the work is light and ill-paid, and therefore given up as soon as any better work can be obtained, the greater part of the boys will probably be under the age of 16. Just at first boys run errands part of their time, but soon begin to work regularly. The numbers given include all who work, whether members of the society or not. Only about 1,400 of the men are members.

Spring-knife cutlery includes some kinds of instruments without springs, *e.g.* desk-knives and some surgical and other cutting instruments. The word is now confined to the mere putting the parts together. Formerly it included also the blade-forging, grinding, and the inside scale and spring-forging.

Spring-knife cutlers work by the piece and therefore only as long as they please, but they generally work long hours, viz., on the average about from 7 a.m. till 8 p.m. One of the leading factories is, I believe, never open longer than this, but most are open from 6 a.m. till 8 p.m., cutlers being allowed two hours longer than the grinders in wheels, if they like to work so long, as their wages are so low. The hours of the boys will depend on the hours of the men under whom they work, and in the factories they are in nearly all cases employed by the men. I have known leading factories open till 10 p.m. at pressing times, and several large factories do not profess to close till 9 p.m. on Thursdays and Fridays. In Bull week people work very long indeed, some from 4 a.m. till 10 p.m., or something like that. After that they scarcely do any work for a bit, only just coming into the shop and out again. It would be a great blessing to Sheffield if Bull week could be done away with; I see nothing in it but folly.

There is supposed to be an hour for dinner and half an hour for tea, but I am sorry to say that often these times are not taken; I have seen many eating and working.

We are trying to work a rule that a man shall not have a second boy till his first is 19, so that he can look to each boy and teach him his trade properly. Some have three or four or even four or five boys, and these are generally the men who work the boys longest, *e.g.* from 5 or 6 a.m. till 9 or 10 p.m., and treat them worst. This is most the case where the work is of an inferior kind, and the most labour must be put into it to make a living. As a general rule, though not always, the inferior work is made in small places.

A boy is bound apprentice as soon as he is taken by a man to work, and though he is only 9 or 10 years old he is bound till 21. Plenty are bound from 10 years old till 21. The master usually takes him into his house, boards and clothes him, and perhaps gives him 1*s.* 6*d.* a week and then perhaps 3*s.* or 3*s.* 6*d.* till he is 14 or 15, and afterwards more. A boy sometimes pays a premium of 10*l.* or so, but very rarely.

Cases not unfrequently occur where apprentices have to leave their masters for improper treatment. This is usually where the master has too many boys and is doing the lowest paid kind of work.

In the new and larger factories the shops are larger and more healthful and cleaner than in the old fashioned places. In almost every large factory there is some machinery. The shafts run sometimes over head, sometimes below the bench, and there are straps and bands, &c. The youngest boys are often put to glazers and buffs, especially if the work is of inferior class, because it is easy. Unless care is taken in throwing on and off the bands it is dangerous. I had an apprentice of my own break his arm because he would be throwing the bands on, and he was 11 weeks down with it. I had often cautioned him about it, but he had done it hundreds of times, and was 16 years old. It was his place to do it. It may be necessary to throw it on and off three or four times in an hour to change the tools.

Fans are used by a few cutlers, but only by a few. It would be a great improvement if they were generally used. I have seen a man clear the shop out by the dust which he made when he had power on to finish bone. In some branches of work, *e.g.* as at bone and pearl scales and finishing, the dust is, I think, injurious. I have seen men cover their mouth and nose over, and their eyes running while at such work. The pearl dust lies more on the stomach, but there is twice the amount of bone dust made as the waste is of less consequence. The dust is sometimes almost as bad as in racing a stone, and the places want good ventilation. Except for the dust there is nothing injurious in any part of cutlery. The work is tedious but not heavy.

The boys generally are not too well educated or persevered with enough. A good few men do attend to their apprentices, but when a man has a number of boys he is generally of that avaricious turn that he cannot spare them to go to school, as parts of his work can go on after the engine has stopped.

I know the factory rules, and I believe that some like them here would be beneficial to the children and not any worse for the parents, or rather would be good for them too after the system was in practice. If children were better educated, when they grow up they would learn to take better care of their own children. As regards the general character and moral habits, I think that there has not been much change within the last 20 years, but that what little there has has been for the better.

204. *Charles Allen*, scale cutter at Wells's wheel. —Henry Bolland, aged 11, worked for me, cutting scales at a steam circular saw and going errands. He was putting the band on and did not notice that it was loose on the shaft, and it took him up to the ceiling and turned him round flat along the shaft. The pressure of his body between the shaft and the ceiling stopped the machinery, and the band above nearly broke. His arm was broken in two places, and they took it off at the Infirmary between the

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shoulder and elbow. It is a wonderful cure, and he was well enough to look in here to-day, though the accident happened only three weeks ago.

In using a circular saw it is very useful to have a "cutting off stick," or bit of wood, which saves much danger. This one I made myself, and never saw any just like it for safety. If it is used properly a boy cannot hurt himself. If they do not have something of this sort they slit their fingers.

MESSRS. JOS. RODGERS AND SONS', CUTLERY MANUFACTURERS, NORFOLK STREET.

205. This is well known as a cutlery manufactory of high standing. The character of the buildings and the internal arrangements correspond. A shop in which dusty work is done, viz., cutting ivory with circular saws, is very lofty, and the large sash windows were open at the top; it would be well if such rooms were more common than they are, where dusty work is done. The proportion of boys in the wheel is very small. In one hull out of 21 persons only three were under 18, viz., two of 16 and one of 17.

206. *Mr. Newbold*, one of the firm.—Cutlery in its strict sense is the making up of knives, table spring and other kinds, razors, scissors, and surgical instruments. The number of large cutlery manufactories, *e.g.* employing 100 persons or so on the premises, is quite small, but there are a large number of smaller places with from 10 to 30 or 40, and a great deal of work is done by out-workers at their homes or in small shops in the town and the neighbouring villages. The forging, grinding, and hafting or fitting with handles, are three entirely distinct branches of employment, though all are carried on upon our premises here.

We use much less dry grinding than formerly, but for some parts of the work, as razor grinding, it is necessary. The stone is keener dry, and answers better where much steel is to be cut away. The blade too must be constantly watched, and if the stone were wet this could not be done without stopping each time to clean the dirt off the metal. The fan has very much diminished the bad effects of this work, but often the men do not use it. It is in one part of the hull, and communicates with the separate troughs by bands. Sometimes, however, from mere neglect, a man will work without using it, and when asked why he does so will say, "Oh, I did not know the "band was off." It is effective when it is used. About 20 years ago we had scarcely any grinders at work over 45 years of age, but now some of the best are 60 or more. I think, however, that grinders had to give up work not only from having the grinders' asthma but also from the injury to their eyesight by the strain of constantly watching the work. This cause must remain the same, but there is also a great improvement in the habits of the men. They are much less dissipated now than formerly. Regulations as to the hours of work of the young would make no difference to us.

207. *Henry Matthewman*, age 17, cutler.—Can tell the letters but not read. Was at day school from as long as I can remember, till 12 years old, when I came here. Missed going sometimes, but have gone several days or a month, and never miss. Have been to a Sunday school once or twice since, not more. Have been to chapel, but have missed a good many times lately. One name that they preached about was Jesus Christ, but I cannot say any others, and I cannot tell anything about Him. He was not killed, but died like other people. He was not the same as other people in some ways, because He was religious in some ways and others isn't. He was alive again, but I cannot say if He is now. He was on a cross, but that is not how He was killed.

[A boy of 14, William Brunner, also questioned, could scarcely spell.]

208. *Henry Barkwell*, age 12.—Cut ivory with a circular saw. Am apprenticed till I am 21, and get 4*s.* a week for mother and 6*d.* to spend. Come to work at 8 and give over at dusk. We haven't gas. Go home from 1 till 2 for dinner.

Came here from school. Can read and write, but not so very well.

[This boy, who is young for such a dangerous work, was allowed to come out of consideration for his circumstances.]

209. *James Roberts*, age 14.—Polish penknives. Work from 8 till 6, never longer. My brother and I work here with father. Can write a little bit, but not a deal. (Reads "little red breast" as "robin;" a picture of a robin was over the words.) Go to a chapel.

210. *John Mason*, age 16.—Make up penknives. Have been at it three years. In this shop there are only two youths besides me. Come at from 7 to $7\frac{1}{2}$ a.m. and leave at from 7 to $7\frac{1}{2}$ p.m.; sometimes stay till 8. Have 10 days holiday at Christmas; two at Whitsuntide and Easter. Could write once. There are 9 elevens in 121—are 10—are 12.

211. *William Richards*, age 12.—Heat for father at a forge. Here a year.

At school before, and could read and write, and got to rule of three. (The father says, "No, only a few "of the earlier rules"). There are 104 pence in 9*s.* Reckoned by "100 pence is 8*s.* 4*d.*"

[Works in front of the forge in a strong draught from the window, which was shut for me.]

212. *Mark Rutter*, blade forger at Rodgers' wheel.—Have a lad to work for me as "heater." He blows the bellows, and holds the metal in the forge to heat it, and hands it too me. This is the way in which boys are employed by forgers. Take them at about 10 years, though I once had one of 8, but I found that he could not manage it, as it takes some care, and so I gave him up. Do not think that they can manage it before 9. We learn them to use the hammer a bit, and then some become apprentices, but they do not get to the hammer till 13 or so. We are not very early comers in our trade, and do not come till 7 or 8 a.m.; but the boys have no regular hours, but depend entirely upon their masters, who are all piecemen, and work according to what they have to do. Some go on very late, till 8 or 9 p.m., but here we are earlier. In the fore end of the week the men work easy and stop a little to keep Saint Monday and work hard in the latter. The boys' meals also depend upon the men. Towards the latter end of the week some do not get more than 10 minutes or so for dinner, and many usually not more than half an hour. Of the lads that I have had I should think that not half can read, though I do not ask so particularly about it.

213. *William Dickinson*, age 15.—Heater to last witness. Began as heater here at 9 years old. Never go the Sunday school.

MESSRS. G. WOSTENHOLME AND SON'S, CUTLERY MANUFACTURERS, WELLINGTON STREET.

214. *Mr. Gorge Beeley*, manager.—This is one of the largest cutlery manufactories in the town. From 300 to 400 persons, including those in the wheel, are employed in it. Machinery is used all through the place. The wheel runs from 7 till 7, and in the rest of the factory work is from 8 till $7\frac{1}{2}$, and on Saturday till 3.

Metal Manufactures.

Sheffield District.

Cutlery.

Mr. J.E.White.

a.

On that day there is no dinner time, on other days there is an hour and a quarter, and half an hour for tea. Occasionally some may work in meal times, but as a rule these are taken fully. Overtime happens chiefly in the warehouse where females are employed in rubbing, wrapping up, &c., it is sometimes till 9½ p.m. there. It is also made sometimes in other parts of the factory, chiefly on Friday, *e.g.* till 8½ or 9 p.m., and in a very busy time I have known it 10. Overtime is paid for at a double rate.

MESSRS. HARRISON BROS. AND HOWSON'S, CUTLERY MANUFACTURERS, NORFOLK STREET.

215. *Mr. William Harrison.*—We are general cutlery manufacturers. Much of our work, probably half, is done off our premises by outworkers in small places. Most large cutlery manufacturers, I should say, have part of their work done out in this way.

The only females in our employment are perhaps 20, who are engaged in the warehouse in rubbing and wrapping goods. None are younger than 16 or 17. There hours are from 9 till 7½ with an hour and a half for dinner. We give them tea here, as we find it cheaper than letting them go away for their own. The boys, except an errand boy or two, are all engaged by the men and work as helpers to them. There may be 60 or 70 of them, and the youngest perhaps 12 years old. The engine runs only 12 hours a day, or only so slightly and so rarely longer as not to be worth speaking of. Only parts, however, of a cutler's work depends upon the use of power, and the forgers not at all, so that the men can work longer if they please. The works are open now at 7 a.m., and in summer at 6 a.m.; and they are generally closed by 9 p.m., sometimes perhaps later. It depends upon the man who has the care of the place. The men, however, work only just as they please, and sometimes some do not come in till 11 a.m. That is why cutlers do not like working in America, because there they have to be in the factory each day regularly. The boys' work depends upon the men, but I think that as a fact they always get enough time for meals, including an hour for dinner. In respectable cutlery establishments it is not, I should say, common for men to work long hours. This happens, if anywhere, in the small shops and out places where the cheap class of goods are made, *e.g.*, common pocket knives like this, which we buy from the small makers instead of making them ourselves.

We have all our grinding done off our premises; the men are perhaps in a dozen different wheels. Wheels are often built as a commercial speculation and let out to individual grinders. Even when a manufacturer has a wheel of his own, he generally lets parts of it off in the same way.

The cutlery trade is almost entirely confined to Sheffield, with the exception of a little table-knife making in London. Steam allows of more work being produced now than 20 years ago, but I do not know that more persons are employed in the trade.

MESSRS. J. WILKINSON AND SON'S, CUTLERY MANUFACTURERS, CHURCH STREET.

216. *Mr. Wilkinson.*—There are four main branches of the cutlery trade, viz., table knives, razors, pen and pocket knives, and scissors. Formerly these were often carried on separately, but now it is more usual for a manufacturer to carry on two or more together. The whole cutlery trade has much increased of late years. More work is done in factories than formerly, in proportion to the work done out. Many little makers or journeymen cutlers, though working independently and on their own account now work in factories, and the manufacturer buys the goods from them just as he does from those who work outside. These small makers can get cheaper labour than a manufacturer can, and sell him goods of a common kind cheaper than he could make them, *e.g.* we can buy common scissors from them 20 per cent. cheaper than we could make them ourselves.

But little machinery is used in cutlery proper, *i.e.* excluding the grinding. Machinery for the forging was invented some time ago and failed, and though it has been taken up again lately, the forging is likely still to remain hand work.

Wheels are often built as a speculation by shares, and the work goes on without any practical head or manager. The engine man is usually the only person on the spot who has any charge of the place.

Our works are open from 8 till 8, but the men work only by the piece, and are not tied to the time. I think that now we have no boys here; the youngest I believe is 20. There are a few women in the warehouse engaged in dressing with a file, burnishing, &c. Their hours are from 9 till 6. Saturday is becoming a shorter day, and the bulk of wages in the town are, I should say, now paid by 2 p.m. on that day.

The working men generally are much more regular in their work and more provident than formerly, and there is not nearly the same amount of drunkenness. I attribute this to the improvement of education, and to the working people following the example of the classes above them.

217. I visited a bone crushing and bone button making factory. In the former only men are employed; a boy or two wheeling coal. The buttons are turned, drilled, &c. by a small number of women and girls at lathes worked by steam. The button trade, however, at Sheffield, as I am informed, has become very small in amount.

MESSRS. WM. HUTTON AND SON'S, ELECTRO-PLATE MANUFACTURERS, HIGH STREET.

Electro-plate.

218. Several young boys are engaged in the rolling mill and stamping shop, in which the metal is shaped. Their work is just of the kind as some described at Birmingham. Passing the blanks of forks and spoons through the rollers looked dangerous work for young boys, and was remarked on to me as such by the proprietor. "Little Johnny lost his finger," said a young boy who had lately begun rolling. The fingers come almost in contact with the roller, though gauges are put which, if care be used, prevent the finger going too far, and the roller can be stopped. The premises are much cramped owing to their position in the very centre of the town; and it is in consequence found impossible to provide washing rooms. These would be very desirable in work of so dirty a nature as the buffing, in which females are engaged, unavoidably is. The shafts have been fenced in consequence of a fatal accident.

219. *Mr. Hutton.*—We carry on both branches of the electro-plate trade, viz., the spoon and fork branch, and the general or more ornamental branch We do not perform the actual process of electroplating ourselves, as that is more conveniently and better done on a large scale elsewhere, nor have we

any casting. There are about 50 boys and girls under the age of 18 on the works, but they and the women are all employed by the men, who can keep them better to their work. The details of the business are so many that it would be impossible for us to attend to all; and part of the work, viz., buffing, is so dirty that only females of not a very superior class like to come to it, so that we would as soon not have the direct responsibility of them, and we do not inquire too much about them. I believe, however, that the boys and others are perfectly well treated and paid. The females get from 3*s.* up to 12*s.* and 14*s.* a week, according to age, and the boys begin at about 3*s.* and rise usually 1*s.* each year.

Wherever there is machinery there are sure to be accidents at times if there is any carelessness. We have done what we can to make our's safe. There are two principles. One is to have the shafts overhead and the bands coming down from it, but our shops are not high enough for this. So we follow the other, *i.e.*, box off the shafts which are low down. We were required by the coroner to do this in consequence of a fatal accident. Another female had been caught in the same way, but, though this caused much alarm at first and it was thought that she was dead, it was found not to be serious. The boys get their fingers in the rollers, though we do what we can to make them safe. About 15 boys, from 10 years of age upwards, work in the rolling mill and stamping shop. In other factories where the same kind of business is carried on, young boys are probably employed in the same way.

We find much inconvenience owing to our central position from the want of ground space. We tried to put up a washing room, but two would have been wanted, and we found that we could not spare the space. There are water taps about the place. There are separate privies, which is of importance. Some of the boys help in dipping things in acids, viz., *aqua fortis.*

There are several females in the warehouse, some engaged in wrapping up things, but most in polishing with the hand and rouge. Numbers of females are engaged in warehouses in Sheffield in like manner. In cutlery warehouses part of their work consists of whetting the blades on hones.

Our hours are from 8 till 7, and overtime seldom happens, and never later than 9, or if it ever is, the children are not kept. The trade is in itself pretty steady, and our own business is long established, so that we can keep to pretty regular hours.

Any moderate regulation of the hours of work would make so little difference to us that we should not mind it at all. I have no doubt that some arrangement for children working only half time could be made if it were necessary. The men would have to see to that and find more children.

I am well acquainted with Birmingham and its manufactures, having come here from there. There are not nearly so many workers in small outshops here as there. Here they are more in factories. The effect is that the workers here are much more independent and better off. There is not near so much competition from small makers of inferior or worthless goods, and a larger manufacturer can afford to hold out better than the small makers, who from their necessities must sell at any price. What correspond most closely here to the Birmingham outshop workers are the makers of small and cheap cutlery, such as pocket knives, and these are some of the most poorly off classes in this town.

220. *Robert Furness*, age 10.—Cob up forks and spoons for that boy (aged 13), who puts them through the rollers. Work from 8 till 7, and have an hour for dinner.

Was at crinoline steel rolling mills before, but only worked there a week, because mother said it was so greasy and too far off. The proper hours were from 6 a.m. till 6 p.m., but all the week that I was there we had to work till 9 and 12 at night to make overtime. It was till 12 three nights. It was at the time of the flood (more than half a year ago). Cannot read or tell the letters.

221. *Herbert Shaw*, age 13.—Cob up for a stamper, and sometimes pull a stamp. Same hours as the last boy.

Went to a brush making place at 9 years old, and worked from 7 a.m. till 7 p.m., but made no overtime. It was not machine work. There were about 13 boys. Was not the youngest. There was one only going in 7.

Did go to Sunday school, but do not now because I have no clothes. The man gives me 3*s.* 6*d.* a week; father is an optician and has a bit of work at home; and I have a brother at work here. Went to St. Mary's day school when I was a little boy. Go to church at night and hear them read about God.

MESSRS. HENRY WILKINSON AND CO.'S, ELECTRO-PLATE MANUFACTURERS, NORFOLK STREET.

222. The work and work-place are much like others of the same class described at Birmingham. There are separate closets and washing places. In a casting shop a boy was shovelling sand and helping the men, much as in brass and other casting shops. The shafting runs along the top of the workshops.

223. *Mr. Henry Wilkinson.*—Our establishment, though there are others larger, probably gives a fair specimen of the whole manufacture as carried on in Sheffield. We do the plating ourselves, as we find it more satisfactory. We have casting shops; and we also make plated cutlery. There are establishments which plate largely for the rest of the trade.

We reckon our week to be 59 hours. In winter we pay at 5 p.m. on Saturday, and in summer at 2, so as to let the workers get away a bit earlier. We seldom if ever want much more than these hours. The people themselves like as a favour to work longer for three weeks or so before Christmas.

Our people have several holidays, and at each we give them 1*s.* a-piece to spend, or, if they like, they may work and get paid. These are, four days at Christmas, besides Christmas Day, New Year's Day, at Easter and Whitsuntide two days each, and half days on Shrove Tuesday, the 5th of November, and each of the two Sheffield fairs. These holidays are, I think, common in the town.

We should have no objection to a regulation of the work hours of young people if it left our week not shorter than it is. It might be more convenient to the manufacturer to lay down a rule that there should not be more than seven days' work made in a week and that only in a certain number of weeks in a year, than to limit each day's work. But no reasonable person, I should think, would object to a slight inconvenience if it were necessary for the protection of young people and were for their good. We should be glad to bear our share. We tried to have a bit of a school but found that we could not keep it up.

224. *Ruth Hobson*, age 14.—I smooth the metal with sand at a steam lathe. Was at a crinoline steel manufactory before. There our hours were from 6 to 6 and in winter from 7 till 7. Have made overtime till 9 for a week together, but not often. That was only in winter; in summer they were very slack.

Do not know all the letters; not that—B, nor A; "u" is "n"; know "t." Go to Sunday school.

225. *Peter Palue*, age 12.—Cannot spell. Was never at school; grandfather wouldn't let me go when I was 6 years old. Don't go on Sundays. Go to a chapel sometimes at night, but don't know anything that I hear about; I go to be still and listen.

MESSRS. JAS. DIXON AND SON'S, PLATE AND WHITE METAL, &c., MANUFACTURERS, CORNISH STREET.

226. Most of the work here is of the same kind as that described in electro-plate manufactories in Birmingham; but the original mode of silver plating, said to have been invented in Sheffield, of uniting the silver to the basis by heat and pressure, is also in use. This process consists in fastening a plate of silver on an ingot of the inferior metal, heating, and rolling it out to the required thickness. A great quantity of goods also are made of white or Britannia metal, a compound metal consisting chiefly of tin. In addition to these goods a great variety of powder flasks, shot pouches, drinking flasks, and miscellaneous gun implements are worked up with metal, leather, and glass. The greater part of the workpeople are men, who cast, roll, cut out, shape, and ornament the material. Many of these operations require a highly skilled kind of labour. A considerable number of females, of whom, however, but few are under 18, and very few under 13, finish the surface by buffing, burnishing, polishing, &c., some by means of machinery, but the greater number with the hand alone, called rubbing. A few are engaged in sewing leather for flasks, &c.; a few boys are employed in like ways, or as apprentices in learning other parts of the trade, filing, &c.

227. The greater part of the buildings are new and roomy, with large open space in the middle, and provided with closets and washing places. Some parts of the work are dusty and dirty, and there is a strong smell of the oil used, but the females engaged in these keep a working dress.

228. *Messrs. Dixon.*—We do not like children under about 13, as up to that time they ought to be at school, and the younger boys are so mischievous, besides the loss which they occasion by spoiling work in learning. We continually have to send children back when they come to apply for work, and tell their parents that they had much better take them to school. A few do, however, get taken in younger, but it is only through the parents' wish, not ours. Where there are numbers of the working class of children without the opportunities of education it is important that measures should be taken to secure it to them, but there is no occasion for such measures in this district, as so few children are employed in it. We employ about 600 or 700 people here of whom from 300 to 400 are men, and the rest women with a few girls and boys.

Our hours of work are not the same for each day but are fixed by weekly tables which vary at different times according to the amount of work which is wanted. They are longer on some days and shorter on others. The longest tables are arranged as follows:—Monday and Tuesday, from 7 a.m. till 8 p.m., Wednesday and Thursday from 6 a.m. till 8 p.m., Friday from 7 a.m. till 5 p.m., Saturday from 7 a.m. till noon. These hours are never exceeded though usually they are shorter. There is always an hour for dinner. We know very well what is the amount which people can stand, and if they work longer they knock up. So we have to judge for them what they can do. They have full time for their meals, and this is necessary. At one time we found that some of the women and girls were in the habit of working in their meal times, and the result was that several took to fainting, which seems very catching. We accordingly took measures which put an effectual stop to this. A few who live at a distance may perhaps stop to dinner, but they all take ample time.

There are several holidays:—10 days at Christmas, other days at Easter, when we are generally cleaning up, and at occasional times when repairs are going on, besides gala days and half days at the two fairs and at Whitsuntide. On Saturday the hands generally leave at 12, except before Christmas, when we are always very busy, but the railways will not take goods after 2 p.m. on Saturday.

229. *Sarah Jane Egg*, age 15.—Rubber: am an apprentice. Work about from 8 till 8. Go home an hour for dinner at 12 and have tea at 5.

Can write a little, did division once or twice. Was never at a night school; go on Sunday most times.

230. *Emily Lee*, age 14.—Rubber; apprentice to a woman.

Was at day-school till here. Can tell the letters, but not put them together.

231. *Edwin White*, age 11.—Rub, and carry pots. Come at 7 and 8, and work till 8. Breakfast before I come. Worked at another place before; hours there were from 7 till 7.

Can read a very little.

232. *William Watkin*, age 11.—Buff spoons on a brush at a steam lathe. Am apprentice. Can read and write.

233. *Martha Ann Segwell*, age 12 years, 11 months.—Here three years to-day. Do not ever come earlier or leave later than the regular time. Wash my hands before I go to dinner, and put off my working dress. Am not an over good writer, but can read.

MESSRS. MARTIN, HALL, AND CO.'S, ELECTRO-PLATE MANUFACTURERS, BROAD STREET.

234. The workshops and whole premises have a clean and cheerful look, far more so than is to be found in several places. The workers generally looked very tidy. I was told that "any girls who "like can wash and change and go home quite clean," no men being allowed in their rooms. There are several ventilating shafts reaching above the roof and down to the lower floors. They are said to be very useful at night when the rooms get hot; but in one low room where several women and girls work, and which had a close smell in the morning, the ventilator, which has a double shaft, was shut, as it was said that it would make it too cold. A boy of 9 goes errands; other boys file, &c.

235. The shafts and bands are safely fenced where females work, but only partially where men and boys work. Boys, however, wear aprons; and it would be safer if all the shafts were guarded alike.

236. *George Henry Harley*, age 13.—Polish with rouge at a steam lathe. Work from 7 a.m. till 8 p.m., with two hours for meals. Have not made overtime since I have been here, viz., eight months. Keep this dress here for working in. There is a place where I can wash my hands.

Was at file cutting before. It was only a little place in a yard, and there were five boys. We worked from 7 a.m. till 8 p.m., but never longer. We had no breakfast time, but only an hour to us dinner and half to us tea. Often worked in the dinner hour; don't very often do so here. The engine stops, but sometimes I carry lime in dinner time or such as that. They only gave me 3*s.* 6*d.* a-week at files, but I get 5*s.* here. Went to cutling as errand boy first.

Can read and write, but not do sums. Go to Sunday school sometimes, not to a night school ever.

237. *Elizabeth Hay*, age 17.—Polish plate with my hand. Come at 7 a.m., and leave at 7½ p.m. Some of them stay later sometimes to finish, viz., till 9½ or 10 p.m.; but I have never stayed later than 9. Went to this sort of work first when 13.

Metal Manufactures.

Sheffield District.

Brass foundry.

Mr. J.E.White.

a.

MESSRS. B. VICKERS AND CO.'S, BRASS FOUNDERS, SAVILLE STREET EAST.

238. This is almost the only brass foundry of any size in Sheffield, though there is one of considerable size at Masborough, which I visited. The manufacture is generally spoken of here as "a Birmingham trade." A certain amount, however, of brass work is, I am informed, carried on as part of other Sheffield manufactures; *e.g.*, those of grates, fenders, fire-irons, &c. The buildings of this manufactory are very large and airy. The brass work is principally chandeliers. There is also a department of tin work, viz., the making large tin meters. There are four casting shops, with two boys on the average in each shop.

239. *Mr. F. Sibray*, manager.—These are the largest brass works in the town, as large probably as the three or four others put together, though at the present time not more than about 120 persons are employed here. There may be a few small places besides where two or three, or half a dozen people work. The women and girls here are lacquerers. The boys in the casting shops and most of the others are employed by the men. For the last year the hands have had a half-day on Saturday, working 10½ hours instead of 10 on other days, to make it up. The half-day is becoming very general in the town. The regular hours here are from 6 to 6, with an hour and a half for meals; they are scarcely ever exceeded. If more work were needed more hands would be put on.

240. *Joseph Hutchinson*, age 10.—Have been here getting on for a year. Work in a casting shop getting sand, flouring moulds, &c., and sometimes skim the metal when the caster pours, and help him mix the copper and spelter. Come at 6 a.m. and leave sometimes at 6 p.m., sometimes at 10, 9, or 8; last night it was 10½. Have not left one night at 6 in the month that I have been under the man for whom I now work, but most nights at 7 or 8. Have my breakfast and dinner in the shop. When I first came worked for 1*s.* 6*d.* a-week. Have a cough; am not poorly; it only hurts me when I cough. The sulphur gets into me when I help the man to mix the spelter.

Never was at any school. Can read my A, B, C; learned it off my little brother's book; I buyed a halfpenny one and mother showed me. Have no clothes to go to Sunday school in. Get 3*s.* a-week now. Father is a horse clipper, and has plenty of work when he has a mind to it. Don't ever go to church or chapel.

[Very ragged.]

241. *Charles Gandley*, age 11.—In burnishing shop. Use black lead, and dip the metal in acky fortis and phizz. The acky burns my hands and clothes. Brush it off with lees. The only place where I could get water is at a boiler like in the shop.

Can read, but not much, and cannot write. Was at school till I came here, and go on Sunday.

[Ragged.]

242. *John Henry Drabble*, age 12.—Am filing meters (made of lead and block tin.—J.E.W.) by rubbing them on a flat file. Have been here nearly two years. Go home half an hour to breakfast and an hour for dinner. Sometimes wash when I go out. There is a washing place in the lacquerers' place, where the lacquerers washes 'em.

Cannot read much, and cannot write or sum.

[His hand is covered with the lead and tin dust.]

243. *Annie Swallow*, age 13, lacquerer.—Sometimes go to school on Sundays. Cannot read or write, but spell a little.

MESSRS. GUEST AND CHRIMES', IRON AND BRASS FOUNDERS, ROTHERHAM.

244. These large works, like two of the other largest metal works at Rotherham, are built on a plan well suited to the health and comfort of the workers, and apparently to the good management of the business. They contrast very favourably with many of the Birmingham brass foundries, the advantage being attributable no doubt to the greater facility of obtaining space. Most of the workshops are in a very long range of buildings, admitting light and air from each side, and reached by convenient iron staircases from the outside. The different workshops are thus easily separated by locked doors. The large casting shops are open to the roof, and well ventilated; but on entering one just after the operation of pouring had been performed, and not having been in brass-casting shops for a long time past, I found the atmosphere very unpleasant to the throat. There are 26 brass-casting furnaces in four shops, besides an iron foundry.

245. The lacquering room, in which a few females are engaged, is well arranged, being open to the roof, and each lacquering stove having over it a pipe with a mouth equal in size to the surface of the stove for carrying off the heat. A young woman here, who had worked in a lacquering shop at Birmingham, where I did not notice such pipes in use, spoke of their benefit in carrying away the heat. The work generally is much of the same kind as in Birmingham brass foundries, much of it consisting of filing.

246. The greatest variation in the hours of work was stated to be in the casting shops, work of every kind having of course to come from them. Owing to the unhealthy fumes, however, it is the branch of brass work in which long hours are least desirable for young boys. One caster for whom boys appear to work longest was stated to be one of the least regular men as to work. When sent for to explain why he kept them so late, he stated that he could not do without them.

247. *Mr. Guest.*—We employ between 300 and 400 persons here; of these about 100 are under the age of 18; but we object to taking any children under the age of 13, though we allow a few, who are sons of some of our men, to come younger, but not under 11. We have no females except a few lacquerers.

Our day is from 6 a.m. till 6 p.m., with an hour and a half for meals. On Saturday all leave at 1 p.m. We were the first in this neighbourhood to introduce the short day on Saturday, about 18 years ago. The time so given is, I believe, as a rule, spent rationally and well, *e.g.*, by many men in their gardens. The amount of work done in the week, instead of being diminished by the loss of time is, I believe, increased by the rest which is given; at any rate the best proof of the half-holiday answering is, that nearly all the other large works in the town have adopted it.

We should have no objection to a law limiting the work of children and young persons to our present hours. If more work were needed in a given time, we should simply increase the number of our hands. Our premises are large and roomy, and would easily admit of our doing so.

The question of confining children to half-time scarcely concerns us practically. For so small a number it might not be worth while for us to make arrangements for half-time at all. But we should not look at this merely as it affects ourselves. We consider that, as employers, we have duties as well

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as interests, and what the children ought to have we should wish to give them. We should be glad to do anything for their good.

We insist on the hands coming punctually to work, and on Monday just as much as on other days; and we also require sobriety and steadiness. We find that when a good system is once started, it works easily and well. Our men are a sober intelligent set, and such as take a lead in clubs, &c. In 20 years we have scarcely had a case of a man of ours being taken up for drunkenness.

It is possible, however, that other employers in our branch of business might feel difficulties which we should not from any legislative restrictions on labour. While we employ only a dozen or fifteen children, other manufacturers, making just the same description of work, would probably employ a much larger proportion, perhaps four times the number. A want of room or other causes might be an obstacle to putting on extra hands when needed.

Though we occasionally make overtime we have never real night work, and I should be very unwilling to have it. Where it prevails, as in some manufactures it does, and no doubt necessarily, its moral effect on the boys engaged in it is very disastrous. In any work in which young children can be employed, the wages which they can earn, however small, are sufficient to make too many parents take them from school much too soon.

We entirely concur in the important object sought by this inquiry, and will gladly render our utmost aid, now and hereafter, towards its accomplishment.

248. *Thomas Gaynon*, age 10.—Work in a brass casting shop. Hours are from 6 till 6, but when I make overtime I stay sometimes till 9. Have made overtime nearly all this week till to-day (Saturday), and made a day over. The week before last I made 73 hours, being 13½ hours overtime. One of the nights I stayed till 9½, another till 9, another till 8½ p.m. Have stayed till 10 p.m. getting sand for master, &c. Have an hour for dinner at 12, but sometimes wait till 12½ for it, and then begin work again half an hour later. Sometimes take dinner in this shop; did yesterday.

Was at a day school six months, and go to a ragged school on Sunday. Can read a little.

> [A boy of about 12 years old, Henry Houghton, made 72 hours in a casting shop in the same week, working two nights till 9 p.m. and three nights till 8. The facts appeared by reference to the time book.]

249. *James Brooks*, age 12.—In another brass-casting shop. Make overtime most weeks. Seldom later than till 7 or 8 p.m. Sometimes we go home to dinner, sometimes bring it in here. Don't wash before dinner, but wash me at night. Mother says the work don't suit my health very well; have headaches. Have been here nine months.

Can read, and go to Sunday school.

250. *Joseph Simmenhite*, age 15.—Work at a lathe. Have often worked overtime till 8, but not later. The others in this shop have made overtime till 9 for a long while; I cannot say just how long. There has been overtime, more or less, for the last four or five months.

251. *Edward Woodfield*, age 13.—File brass taps. Stay till 8 when I work overtime. Get 3*s.* a week. Left school at 11 years old for work.

> [The taps are said to contain but little lead. (Birmingham evidence, B. Nos. 22, 737). The father, a Birmingham man, gets 2*l.* 2*s.* a week in these works, as well as having another son here, and has been remonstrated with in vain for not keeping his boys at school.]

252. *John Connigan*, age 8.—At filing. Have lately come. Am bound to make overtime next week; mother said so.

Cannot read. Have been to the Catholic chapel. They tell us about good men, but I cannot tell the name of any. Don't know what Moses is, or if he was a man. Don't know nowt about Jesus Christ, or if He was killed or crucified, or if crucified means put to death. They never told us about the Gospel. Can hear what they say at the chapel.

> [Looks more than 8. The man under whom he works was remonstrated with for engaging so young a boy.]

253. *William Snow*, adult.—Dip the metal; always do it myself. Boys' constitutions could not stand it. Feel it in my chest, and have a cough. If it is a heavy day, and the air damp, as it was yesterday after I had been in the dipping shop two hours, you could hardly bear it. We wear these green baize aprons to keep the acid from burning us. Wear cloth trowsers too. If it was doeskin it would burn like shot holes in it. The best thing for us to take for our health is plenty of milk. The black leading, which two lads under me are doing, is unhealthy from the dust which flies up. At that work you spit up quite black.

MR. J. GREAVES', CUT NAIL MANUFACTURER, BROAD STREET.

Cut nails.

254. The cut nail manufacture carried on here differs from that described in the Birmingham district, inasmuch as steam power is used only for cutting the large strips of iron, while the nails themselves are cut from these by hand presses or flies worked by females, instead of by machines worked by power and only fed by workers. They are headed, &c. by machines worked by treadle. The workshops are small and dirty; but this kind of manufacture is probably of no great importance, as it is only in a limited kind of work, viz., very small nails, that the hand can compete with power.

255. *Mr. Thomas Stansbury*, manager. — The manufacture of cut nails by hand machines is almost superseded by the use of power. Birmingham, Wolverhampton, and Leeds are the great seats of the manufacture. The only other manufactories of cut nails in Sheffield are on quite a small scale.

Wrought nails are made in Rotherham and its neighbourhood, and to a considerable extent in the neighbourhood of Belper for several miles round. A nailer works, usually with his family, in a small shop at the back of his house. There are usually four persons working to a fire, and I never saw more than six in one shop. (*He here describes the system just as it is already described in the Birmingham district*). They work just as they please. The men often drink three days, and work late the rest of the week to make up. They can work better when all work together, so that the work is likely to depend on the head of the shop or family. These and the Dudley and Bromsgrove neighbourhoods are the only wrought nail districts that I know of. Of course in any large town there may be one or two wrought nail makers working for farmers, &c. Screw making is not a Sheffield trade worth speaking of. We get screws from Birmingham.

> [Wrought nails are made also in the neighbourhood of Wakefield.]

MESSRS. S. FOX & CO.'S, STEEL, UMBRELLA IRON, AND WIRE MANUFACTURERS, DEEPCAR.

Umbrella irons, &c.

256. These large works, employing very nearly 800 persons, have sprung up in a retired valley about eight miles north-west from Sheffield. About 170 girls and 100 boys, from 8 years old up to 18, and 100 women are employed. Most of the girls' work is of a light kind, consisting chiefly of hand press

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Umbrella irons, &c.

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or fly work, of the same kind as much described at Birmingham. Indeed, the umbrella manufacture is spoken of as quite a "Birmingham" trade. There is in general ample space, but one of the rooms in which a number of young girls work is low, and with insufficient means of admitting air at the windows. It felt hot and close.

257. In one shop a number of girls were engaged in what is strictly glass work. They tip the umbrella ribs with a glassy substance to imitate ivory, by heating the iron red hot in gas jets blown by steam power, and applying a composition.

258. Other kinds of work are carried on upon the premises; *e.g.*, rolling cold steel, hot bars, &c., as in ordinary rolling mills, wire drawing, &c. Some of the rooms smell disagreeably from the vitriol used for the steel. The rollers at which boys work are protected by screens.

259. The stated hours are from 6 a.m. to 6 p.m., and in winter from 7 a.m. to 7 p.m., with the usual factory meal times; overtime is made for about two months in the year, in summer till 8 p.m. and in winter till 9 p.m., with half an hour for tea, but very few of the younger hands ever work overtime. The employers state that they consider the object of this inquiry very important.

BARNSLEY.

260. The collieries and the linen manufacture leave but little room in Barnsley for other manufacturing employments on any large scale.

MESSRS. PIGOTT AND FARRAR'S, IRON FOUNDRY, BARNSLEY.

Iron foundry.

261. *Mr. J. T. Pigott.*—We make machinery, boilers, &c. There is also a department for joiners who work in wood. The day's work is from 6 till $5\frac{1}{2}$, with meals. There are two other works of the same kind in the town. Sometimes the hands must work late, either because we are busy ourselves or the machinery in some factory breaks down. That must be put right at once, or would throw the factory out. It may probably be that only a few hands are required to work late. The time-book shows, *e.g.*, that while some have worked only their usual time, some others have made $9\frac{3}{4}$, 9, $8\frac{1}{2}$, $6\frac{3}{4}$ days in a week, and so on. There is no need for any legislation as regards our business, but if there were it would not throw us out much. We should merely send the lads home. Full three-fourths of those employed here are men, and scarcely any of the boys are under the age of 13.

262. *Benjamin Bagnall*, age 15.—Riddle sand, &c. in the foundry. The hours are from 6 till $5\frac{1}{2}$, with meal times; but we give over work at all times, as we are wanted, *e.g.*, at 7, 8, or 9 p.m. The latest that I have worked is till 12 p.m.; had to begin again at 6 next morning.

[Another boy of 16 had worked till $10\frac{1}{2}$ p.m.]

263. *Mr. Michael Thomas Sadleir*, medical officer of health for Barnsley.—The bulk of the population of the town, which is about 18,000, are engaged in linen manufactories and collieries. The hand-loom weaving of linen is fast decaying here. There are a few iron-foundries where machinery, boilers, &c. are made. Accidents happen at the bobbin mill from cuts, chiefly to boys.

I am very glad that Government is taking up this inquiry. The factory legislation has contributed wonderfully to the good feeling and contentment of the working classes. All like it now. Even masters and others who opposed it approve of it, and the working classes speak of it as "our grand charter." In this neighbourhood we have the means of judging. The change of feeling in this town since it was introduced from one of political and social disquietude to one of order and contentment is wonderful. No one not acquainted with the facts could conceive it.

MESSRS. S. LAYCOCK AND SONS', HAIR SEATING AND CURLED HAIR MANUFACTURERS, PORTOBELLO AND MILLSANDS, SHEFFIELD.

Hair seating.

264. This is now the only manufactory of the kind in the town. Out of towards 300 persons employed all but eight are females, about a third of them under the age of 18, and a third of these under 13. The first processes are for preparing the hair, which is brought in its rough state as it is taken from the animal; in part of which steam power is used at the Millsands works. Most of these processes cause some dust. The curled hair, used for stuffing mattresses, &c. is produced by spinning hair into a rope, which is then twisted, which is done at present by the hand, though steam machinery, it was stated, would perhaps be used.

265. The girls are chiefly servers to the women who weave, but they weave also. This work is free from dust, and it must, therefore, be the earlier processes in which the injurious effects from dust, which have sometimes been attributed to the manufacture, arise. The girls sit, leaning over their work, and complain of aches, &c. Some of the looms can be worked by steam, but are not, in consequence partly of the general objection of trades unions to the introduction of machinery, partly of an intimation received that the use of steam power would bring the Portobello manufactory, in which the weaving is done, under the operation of the Factory Acts.

266. At the Millsands works arrangements are being made for securing more air and space, which are needed. The workshops in the Portobello manufactory are light and cheerful, but some smell close, the windows being all shut. Conduits and closets have been placed on the landings, and great care is used by the employers to insure propriety of conduct and general comfort. A school was established for the workpeople, but given up owing to the difficulty of securing attendance. The girls show great need of it.

267. The Messrs. Laycock, though most readily affording all the information in their power, in their Tabular Return strongly deprecate any legislative interference, which they consider to be quite unnecessary, while it would be attended with serious inconvenience and injury to their business. Their hours, however, never exceed the factory day, and are often less. They consider that relays of children could not be employed, as the remuneration would not admit of paying two girls in place of one. They do not, however, suggest any other difficulty as to relays, nor is there any arising from the nature of the work, which is very simple. They employ 25 children.

268. *Sarah Hopkins*, age 13, server.—Here five years come Good Friday. The hours are called from 7 till 7, but we come later if we please, as at 8 or $8\frac{1}{2}$, and some do so, but we all have to be out by $6\frac{1}{2}$ or a little after all through the year. Have us breakfast before we come, and have an hour for dinner at 12; sometimes stop only half-an-hour for it, never less, but generally more. Most have it here. Do not

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know what I earn, because I serve for mother. She is paid so much a piece; a piece for which she gets 18*s.* will perhaps take a fortnight. She does not put anything by for me; she can't afford it. Sometimes I weave and mother serves, sometimes for a whole day. The weaving tires both my arms and my legs; the serving tires me too, but not a deal. We have to stop every 10 minutes to fetch the "temples" across the work. Have a week at Christmas, and three days at Whitsuntide, but have not any more holiday in the year.

Cannot spell. Wanted to go to school to learn to read, and asked mother, but she could not spare me, as she wanted me to do the work at home while she was at shop. Go to chapel Sunday morning, and to school in the afternoon. Can't tell any of the names that the preacher reads about. (*Knows some Scripture names when mentioned*). We can't hear so very well; can hear when he says the names, but not what he says about them. The Queen lives in London, but I do not know if she has any name besides "the Queen," or how many days there are in a year or month. Was never outside the town or in a field. They call corn wheat; there is not any other corn. There is barley corn, but not oat.

269. *Eliza Siddell*, age 16. Server to my sister, but weave more than I serve. She pays me 7*s.* 8*d.* a piece, which takes sometimes a fortnight, sometimes more, sometimes 10 days. The time is different, because sometimes there are dark days and we cannot see, and sometimes she or I are at home poorly. Sometime we come before 8, sometimes before 9; 7 is the proper time. Cannot stay later than 6½. The weaving tires my legs and across my back and shoulders, and when it is very hard I very often have pain in my side. Very often ache across my shoulders from it after I am at home, and sometimes when serving, but not so often. Have to lean forward all the time I am serving. Have a cough when I have a cold; it hurts me in my stomach here (chest).

Know some letters, but very few. Have not been to Sunday school so often lately, and never was at work day school; father had not the means of keeping us at home. He is a file striker. Cannot count figures. Four times 7 is 30; —is 28, isn't it? Always thought France was a country, and have heard say that they go over the sea to America, but do not know what they call the water. Sea is water, I expect. Can't say at present whether there is water all round England, or what an island is. Have heard say that the Scotch do not like the English. Could tell a Scotchman because he looks very queer beside an Englishman; he wears queer clothes from what we do.

270. *Annie Bull*, age 11, server.—Can weave a little bit, but not a deal. Sometimes the woman lets me weave a little bit at dinner time before we begin again. Sometimes stop nearly an hour for dinner, sometimes half an hour. All do not begin again at the same time; it is when each weaver likes. Sometimes it is 8 or 8½ a.m. when my weaver comes, but I come afore her and get things ready. Had to come the first eight weeks for nothing as a learner, and then got 6*s.* a piece, but shall get to my 8*s.* this piece. Wear this little handkerchief round my neck because it's so cold in the morning. Have to keep going out and warming us hands when it's so very cold.

It is a good many years since I was at any work before I came here. T'master made horn buttons, and we had to clip the edges. There were five or six girls, all about my age; think I was going in 9. We worked from 7½ to 6, with a dinner hour. Got 2*s.* a week, and master gi'en me 2*d.* for mysen.

Can say the letters, but not spell many. Go to school on Sunday and used to go on week days. Have seen a river at Wicker (part of the town). Don't know if there is any bigger river anywhere. The sea is bigger. Think the sea is not many miles across that ways (*pointing*), but many a mile long. There is only one sea, and I cannot tell the names of any.

271. *Sarah Ellen Thompson*, age 9.—Server to my sister a year and a half and can weave a little bit. Do sometimes when we stop for dinner. My sister, who is 21, gets 19*s.* for this piece and gives it to mother.

Can't tell any letters. Go to school and church on Sundays. Can't tell what the preacher reads about; we can't hear what he says, because we can't often see him. We sit very high in the gallery and he is low. Three times 3 is 9,—is 12. Have seed a soldier. A sailor goes in a boat on the sea. Don't know what a ship is; think a sailor sometimes goes in one. Don't know if an eagle is a bird. Me'll go to heaven, and everybody; not the bad.

MESSRS. G. BASSETT AND CO.'S, CONFECTIONERY MANUFACTURERS, PORTLAND STREET, SHEFFIELD.

Confectionery.

272. The size and nature of the buildings, the use of machinery for several purposes, *e.g.* grinding sugar, moving large revolving pans, &c., and the number of persons employed and processes carried on, give this establishment the character of a regular factory. Towards 150 persons are employed, nearly half of them children and young persons of both sexes. Most of the younger are engaged in simple hand work, as helpers to the men, arranging the confectionery on trays for drying, carrying, packing, &c., and some in making small packing boxes. The mixing of the ingredients for lozenges, comfits, &c., the spreading, cutting out the paste, and several other processes, are for all practical purposes just the same as those carried on by ordinary bakers or confectioners. A pleasant smell fills the works. Most of the employment is healthy.

273. The cleanly look of the children and their bright faces form a great contrast with what are usually found in metal works. The necessity for cleanliness and as much self-control as human nature admits of in boys and girls working constantly amongst piles of sugar plums and candied lemon peel, leads no doubt to a selection of a good class of workers. The hours are those of the regular factory day, and, with slight exceptions, are not exceeded. No child whom I questioned had worked overtime, though one or two do so occasionally.

274. *Mr. G. Bassett.*—The work is pretty regular. We have rather more room than we had, and can now employ more hands, and so avoid overtime, which we were occasionally obliged to have. Looking through the time tickets for last week I see that two boys, each about 12 years old, made 14 hours actual work one day, but I do not see that any other young ones made any overtime in the week. Their work is at packing boxes. The early hours, viz. 6 to 6, which we have here, are I believe unusual in Sheffield. One winter I fixed them at from 7 till 7, thinking that it would suit the hands better, but they liked from 6 till 6 best, because, as they say, it gives them such a nice evening to themselves.

The work is healthy. The worst part of it is sifting or working with the powdered starch. Moulds for running lozenges, &c. into are made of this. The stoves are hot, and boys are occasionally sent into them, but it is the men's work properly. Children scarcely can keep so good an appetite here, I should think, considering the quantities of sweets that they eat,—as much as ¼ lb. each in a day, I should think. There is a rule forbidding this, but of course it cannot be really enforced. The work rooms are built on

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the four sides of an open square, and we can ventilate the rooms well. This is necessary in a work in which we cannot have the windows open much. We are obliged to have tidy children. Plenty apply whom we have to send away because they are dirty.

The wholesale confectionery manufacture is carried on more in the provinces than in London, especially in York and Scotland. The much lower cost of coal here is a great advantage, as we have to use a great deal of steam power. In the Glasgow and Dundee manufactories large quantities of marmalade are made. The processes and manner of work must be much the same in all. Our foreman and several of our men have come from Scotland, York, and other places, and from them I gather that the system of work is much the same in all.

I have been thinking of putting up a library and recreation room on the premises. A printed copy of the rules of the workers is given to every person.

275. *Francis Winsley*, foreman of the works.—In some parts of the works $2\frac{1}{2}$ hours *i.e.* a quarter a day's overtime is sometimes made, but this is not in the part in which most of the children work. In the cellar or lemon-peel department we used often to have to make overtime a bit, but since last year we have had a better system. The premises have been enlarged and more hands are put on. This is much more satisfactory to everybody.

MR. J. GLADWIN'S, PAPER MILLS, ECCLESFIELD.

276. The stated hours are from 6 a.m. till 8 p.m.; steam as well as water power is used. Some machinery in a narrow entrance passage, which almost touches the passer by, and one or two bands, are unprotected, but the place was said to be "very fortunate" as to accidents. Heaps of refuse were lying about, and unhealthy looking mud lying uncovered in a small reservoir in front. The works are on a small scale. There are a few other small paper mills in the neighbourhood. A great quantity of paper is needed for wrapping up the Sheffield goods.

277. *Mary Madin*, age 12.—Catch paper at the cutter. A big girl passes the paper into the rollers at the other end. Work here from 6 a.m. till 8 p.m., but now from $7\frac{1}{2}$ a.m. till 9 p.m. instead. Have an hour for dinner.

Can read, write, and do sums, *i.e.* £ *s. d.* Was at day school till a year ago.

MISCELLANEOUS EVIDENCE.

Medical.

278. In a copy of "Information supplied to Mr. Timothy Holmes, F.R.C.S., in the course of a Government Inquiry about the Hospitals of the County, June 1863," kindly furnished to me by Mr. Hy. Jackson, an eminent surgeon in Sheffield, appear the following question and answer:—

"What particular affections are prevalent in the town, and what in the hospital?—Phthisis pulmonalis, pneumonia, rheumatism, grinders' asthma, and lead paralysis are among the chief, with occasional epidemics of scarlatina, rubeola (variola at present). Fever is rare, and generally occurs sporadically."

Accidents.

279. I am also indebted to Mr. Jackson for the following table:—

ACCIDENTS caused by MACHINERY to LADS under 18 years of age admitted into the Sheffield General Infirmary from November 1, 1862, to November 1, 1863.*

	Name.	Age.	Nature of Accident.	Remarks.
1	Bennett, James	16	Compound fractured arm.	He was caught in a drum.
2	Skinner, Peter	10	Compound fractured thigh and leg.	Ditto.
3	Bashforth, Wm.	12	Fractured leg	Ditto.
4	Allen, Richard	15	Contusions	Ditto.
5	Hord, Henry	10	Lacerated hand	Ditto.
6	Biggs, William	12	Contusions	Ditto.
7	Clayton, James	15	Compound fractured finger.	Caught in a cog-wheel.
8	Finnan, William	12	Scald of foot	From hot metal getting into his boot.
9	Devonshire, John	14	Burn of foot	A splash from a hammer caught his foot.
10	Foster, Henry	13	Ditto	From hot metal.
11	Shaw, William	13	Burn of leg	From hot metal.
12	Foulstone, Wm.	17	Scald of eye	Ditto.
13	Ogley, George	16	„ of foot	Ditto.
14	Bunting, Joseph	17	Wound of leg	From hot wire.
15	Williams, John	8	Lacerated arm	A beam of iron fell upon his arm.
16	Barras, George	12	Fractured thigh	He was boring an oven and it fell on him.
17	Hopkins, Walter	14	„ leg	A piece of metal fell on his leg.
18	Marrison, George	13	Scalp wound	His head was hit by a crane bandle.
19	Amos, Thomas	14	Wound of thigh	He was rolling iron and fell down.
20	Wilson, Henry	14	Wound of abdomen.	Was grinding knives and the points went in.
21	Brown, William	14	Injury to head	From breaking a grindstone.
22	Manning, Thomas	8	Concussion	He fell from a scaffold.
23	Holmes, John	12	Wound of palmar arch.	From a knife blade while grinding.
24	Lee, Richard	17	Wound of cornea	From a piece of metal.
25	Marsden, Wm.	14	Foreign body in eye.	No history. (Qy.—A "mote" in grinding.—J.E.W.)

280. *Mr. John Webster*, coroner.—My district includes Sheffield and all the manufacturing neighbourhood within 10 or 15 miles each way, except on the Derbyshire side. I have been deputy-coroner or coroner for nearly four years.

The most common kind of fatal accident from machinery is caused by bands, chiefly in putting them on or throwing them off. They happen in works of several kinds, *e.g.* iron-works, grinding wheels, cutlery shops, &c. Deaths have also happened from going through rollers, and generally to boys, though in one or two cases to men. My first inquest was on a boy whose knee was slit open with a circular saw and who died after a week of great suffering. One was taken up by a band to the ceiling in a surgical instrument making shop and killed. Fatal accidents to females from machinery are rare. In one case a man was killed by machinery which ought to have been fenced, and the manufacturer had found wood for the purpose, but would not find the labour, but left that to the man, and he neglected it.

Where a death is proved to have been owing to an unguarded state of machinery, I recommend that it should be made safe. Such recommendations are attended to only just at the time and have no general effect.

I never knew an instance where an action was brought under Lord Campbell's Act for compensation to the family. In case of any such claim on account of a fatal accident being made, I should be sure to be applied to for the depositions. The reason why such claims are not made is most likely the want of money necessary to undertake an action.

281. Amongst the copies of depositions furnished to me by the coroner are those taken at the inquest on a boy, aged 13, crushed by the fly wheel in a saw mill. "He had got on the top of the guard of the

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* Some of the cases are omitted from the table furnished to me, as the description does not show them to be incidental to some manufacturing employment. The total number of surgical cases of all kinds for the year ending Midsummer 1862 was 584.—J. E. W.

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"fly wheel to get some sawdust. Boys go there to get sawdust, but he had gone further than he "ought to have done."

Want of light.

Mr. J.E.White.

a.

282. By permission of the writer, I extract below (No. 283) some remarks on the importance of light to health, from a work on "Health," published in this year, 1864, by W. Strange, M.R.C.P., physician to the General Hospital, Worcester, and formerly Sub-commissioner for taking evidence on the health of towns. They have an important bearing on the condition of many of the young engaged in the manufactures of the Sheffield district, especially those who work systematically by night, as in iron-works, thus losing the benefit of daylight, and others who work in gloomy places, as wheels in particular and several other workshops are.

283. "The beneficial effect of light upon the vegetable kingdom is well known to exceed that of any other natural agent. * * * Physiologists are not yet able to define the *modus operandi* of light upon the animal tissues with nearly the same exactitude as they are in the case of those of vegetables ; still they have no doubt of the vast importance of this powerful agent as regards the preservation of health and the attainment of the full development of the animal frame. * * * As regards colour, it is pretty certain that animals suffer very much in the same manner as vegetables when the stimulus of light is withdrawn : their fibre becomes blanched, brittle, and inelastic. * * * In the case of children, whose bodies are undergoing rapid change, this fact is exemplified in a marked manner. * * Light also acts upon the tissues of the body directly in hardening them and supporting their elasticity. The muscles of animals, when they are deprived of a proper amount of light, become soft and inelastic, the nervous power loses its tone from defective stimulation, and the elaboration of all growth seems to be perverted. * * * In the case of children, constant access to plenty of light through the day, and to the direct rays of the sun for a part of it, is most essential to health. Light assists in the elaboration of good plastic blood out of the food, and hardens the fibre after it has been laid down. It also acts as a stimulus upon the organs of sight, and by this means brings about more activity in the various cerebral functions than would otherwise be the case."

284. In a late letter to me, referring to the above subject, Dr. Strange, who contemplates enlarging on it, and giving general results drawn from various quarters, on "wanting light, as it effects the growth "and development of the young," states,—

"I have had opportunities formerly, when in Lancashire, of observing the effects of night work upon factory children, and I have no hesitation in saying that, contrary to what *some* employers were fond of asserting, those children who were subjected to it soon suffered in their health, as I, then attached to a dispensary, had abundant evidence of it."

Views of Operatives.

285. LETTER from the Secretary of the "Association of organized Trades of Sheffield and the Neighbourhood."

SIR, Sheffield, November 26, 1864.

I WAITED on the Secretaries of the Filesmiths' Society, who informed me that there are *about* 3,500 men engaged in the file trade, 1,250 lads or apprentices, and, so far as they knew, some 500 or 600 females. Their rules require lads to be bound before they are 14 years old, but many begin working so early as 9 or 10 years old, some descriptions of work (cutting the edges of saw files for instance) being more adapted for lads than men. * * *

We hoped to have had an interview with you in reference to the question of education and the employment of young children, but you having left sooner than we expected, we have been disappointed. You will find the question briefly touched upon in the enclosed report.

I may add that at our last delegate meeting a resolution was passed urging the trades to furnish you with all the information in their power on the questions you have in hand, and we agreed to assist them as much as possible if applied to.

I have, &c.
WM. DRONFIELD,
Secretary.

J. E. White, Esq.

286. EXTRACT from the annual Report of the Executive of the above-named Association for 1864, enclosed with the foregoing letter.

"A question of considerable importance to the working classes was introduced to the notice of the Executive by Mr. Race, viz., the advisability of taking steps to restrain parents from sending children to work at so very early an age, and of compelling them to give their offspring a better education than they at present receive, and so to improve the rising generation as to counteract as far as possible the ignorance and vice that exist in our large manufacturing towns. The Government Commissioner not having then finished his enquiries, it was deemed advisable to postpone the further consideration of this question—the Executive, however, being of opinion that the subject was one well worthy the attention not only of themselves but of all well-wishers of the working classes ; and they therefore pledged themselves to take up the question again at some future time."

General.

287. THE following letter is from a gentleman to whom I was referred as thoroughly acquainted with the manufactures of the district, and formerly Honorary Secretary to the Sheffield Chamber of Commerce, and himself a hardware merchant and manufacturer.

SIR, Sheffield, November 28, 1863.

THE only answer which can be returned (*i.e.* to the circular, &c. forwarded by me, J.E.W.) is the brief and comprehensive one, that persons under the age stated (*i.e.* 18) are employed more or less in every trade carried on in this district. Perhaps they are most numerously engaged in all branches of the cutlery trade, either in workshops or warehouses, and next perhaps in the white metal, electroplating, and hair-seating trades, in all their branches. Still the answer holds good as regards every other occupation carried on in or around this town.

You will perhaps excuse my adding that, in my opinion, there is nothing, either in the character of the trades carried on in this neighbourhood or in the hours of labour ordinarily enforced, to call for interference or unfavourable comment ; but that, if practicable, the employment of children from 10 to 14 years (which is quite common in many trades by their parent) should be diminished or modified, though how such a desirable end is to be obtained in this locality I really cannot undertake to say.

I have, &c.
W. C. CORSAN.

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General.

Mr. J.E. White.

a.

288. Letter from the Incumbent of Swinton.

Swinton Parsonage, Rotherham,
Dear Sir, November 21, 1863.

It will give me great pleasure to render you any assistance that may lie in my power, the object of the Commission being one in which I have long felt deep interest, and I am rejoiced to find that evidence is now being collected in this locality, where protection for the young is greatly needed.

Shortly after my coming to Swinton, about 10 years ago, a petition was sent from this parish in favour of the Sunday closing of beer-houses. It was signed by about 1,000 persons, but of these about 700 made their mark, the latter number including a schoolmistress!

Peculiar difficulties attend the management of our schools and the education of the children of our poor, owing to the migratory character of our population and the early age at which the little ones leave school altogether for labour, either in glass-works, potteries, iron-works, collieries, or agricultural employment.

The enclosed momorial was extensively signed in this parish, and was presented by the late Earl Fitzwilliam in 1857. All our manufacturers signed it, and many of their work-people, the only point on which they desired to be assured being that any legislation which might ensue from the adoption of the memorial would not be of a mere local character, but *national*, so that the labour market in this district would not be placed at an unfair disadvantage.

The colliers are most anxious for some general regulation by which the education of their children may be promoted, and it is one of the points for which their union is now agitating.

Surely if we can engage the sympathies of the working class themselves in this most important work, the battle is more than half won, one of the chief difficulties for legislation being thus removed.

I need not now dwell upon the *terrible* evils *physically* and *morally* resulting from the too early employment of the young of either sex. They abound here, and if unchecked must sap the foundations of society.

I am, &c.
J. E. White, Esq. John Levett.

289. The Memorial enclosed with the above letter.

To the Right Honourable the Lord President of the Committee of Council on Education.

The humble petition of the undersigned, being nobility, clergymen, coal owners, manufacturers, iron masters, school teachers, and others, in the district known as the South Yorkshire Coalfield, respectfully showeth,

That your petitioners view with deep concern the very early age at which children are taken from school, and thenceforth wholly employed in potteries, iron-works, collieries, and glass-works.

That this system prevents them from being properly instructed in their religious and moral duties, as well as from receiving that amount of intellectual education which would fit them to become good subjects of the Queen and useful members of society.

That while the age at which children may be lawfully employed in coal-pits is limited, this is not the case in potteries, iron-works, and glass-works.

That the Act 3rd and 4th William IV., chapter 103, entitled "An Act to regulate the Labour of Children "and Young Persons in the Mills and Factories of "the United Kingdom," having been found to be productive of the best results in the case of those classes of persons to whom it applies,

Your petitioners humbly memorialize your Lordship to introduce in the next Session of Parliament a measure which will extend similar benefits to those employed in the above-named kinds of labour, viz., in the potteries, iron-works, collieries, and glass-works.

290. Letter from the Incumbent of Thorpe Hesley.

Dear Sir, Thorpe Hesley, Nov. 26th 1863.

There are no nail factories in my parish. Those made here are wrought, and, as you suppose, at home. Children are employed in the trade, yet very few, and mostly above 12; hence they do not attend school.

The chief occupation for children in the place is mining. To this they are put when very young, evading the law by some means. There needs much stricter inspection on the subject than we have at present. Indeed, through this and similar causes, the young are growing up in perfect barbarism; and what the consequences of such a state of things will hereafter be surpasses conception. Education is neither sought after nor cared for. Parental control is defied, and morality at the lowest ebb possible. My own opinion is that the Legislature *must* interfere by some strong compulsory measure; ought to provide free education up to 12 years for every child, and insist on the negligent sending their offspring to be taught. No other method would answer in a population like mine. * * * *

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Yours truly,
J. E. White, Esq. R. C. Weston.

291. Letter to me from the Incumbent of Kilnhurst.

Kilnhurst Parsonage,
Dear Sir, Nov. 21.

The subject of the employment of young children in manufactories is one which cannot fail to be deeply interesting to any clergyman who has the charge of a parish with a manufacturing population, as it is one of the greatest difficulties with which they have to contend in connexion with education.

I fear that my experience is like that of most of my brethren similarly circumstanced. So soon as the children are able to earn anything the parents take them from school, and their only subsequent opportunities of receiving instruction at all are at the Sunday or night schools.

(Potteries, glass, iron, and coal works are then referred to as the employment of the immediate neighbourhood.—J.E.W.)

Yours faithfully,
H. Fleetwood Sheppard.

292. LETTER to me from the Incumbent of Oughtibridge.

Oughtibridge Parsonage, Sheffield,
Dec. 3rd, 1863.

DEAR SIR,

THE file trade is the principal trade carried on here, but the mechanics work in shops of their own, and take their work to Sheffield when finished. We find the attendance in our national schools materially affected by "boys and girls" beginning at 10 years of age to cut files. Very few boys stay in the school beyond 10 years of age. They just leave when they are beginning to do the master and themselves credit.

Yours faithfully,
WM. KNIGHT.

RETURN furnished by the Rev. W. Knight in Nov. 1864, of numbers attending the Oughtibridge National School:—

—	Between the Ages of			Above 12.
	6–8.	8–10.	10–12.	
Boys - -	11	31	9	4
Girls - -	3	14	10	9
Total -	14	45	19	13 = 91

293. I am informed that the recent establishment of an umbrella manufactory in Hathersage, in which many young children are employed, has had an unfavourable effect upon the attendance of boys at the Church school, the effect being that they leave entirely at an early age, or come only irregularly when work is short. Such children earn from 1*s.* 6*d.* to 3*s.* a week, and their fathers, in several cases, from 30*s.* to 50*s.* According to a list of children working in factories in Hathersage last year supplied to me, two were between 7 and 8 years old. A table of the ages of the boys and their average number of attendances is subjoined:—

294. COMPARISON of the AGES and the ATTENDANCES of the BOYS attending the HATHERSAGE CHURCH SCHOOL.

Number on the Books, aged	Nine Months ending Mar. 31, 1864. No. of times the School was opened, 313.	
	No. of Age.	Average times of attendance of each Age for the above period.
Under 6 years of age - -	13	—
Between 6 and 7 years of age -	11	222
" 7 " 8 " -	12	202
" 8 " 9 " -	14^{1}	208
" 9 " 10 " -	9^{2}	258
" 10 " 11 " -	10^{2}	227
" 11 " 12 " -	5^{1}	188
" 12 " 13 " -	9^{1}	121
Over 13 years of age - -	6^{5}	152
* Total on the books -	89^{12}	—

* The average daily attendance at the school has been from 60 to 65, but all these mentioned "on the books" have attended at one time or other during the years specified.—T.S.

The small figures in the "Age Column" denote that the same number are sons of farmers or tradesmen..

Hathersage, November 24th, 1864.

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295. *Mr. G. H. Hurst*, master of the Feoffees' Endowed School, Ecclesfield.—My experience of a school near Halifax, of upwards of 300 pupils, boys and girls, the greater part of them factory half-timers, of which I was head master for six years, was that the generality of half-timers made quite as much progress as the others who attended regularly, and, if sharp, more; and of course more than those who came to school all day but not regularly. Working in a factory generally made the children sharper than the others. The half-timers who came at 8 years old generally came knowing nothing, but they left at 13 good scholars, *i.e.*, they could read, write, and sum, and had a general knowledge of Scripture, with general ideas, also, of geography, history, and common things. Many came at 10 or 11 years of age, and these at 13 could only read, write a little, and do easy sums. Those who came later unable to read, as many did, had not time to get on much. When they are so backward it takes a long time to form an idea even of letters. In common cases a quick child will be able to read easy sentences after six months' school.

The school at Ecclesfield is worked upon the National system. The population of the village is about 1,600, or, with the hamlet of Grenoside, about a mile off, about 3,000. The Sunday school is attended by about 500 children, most of them, except some girls, under 13. But at the day school the number on the books is only about 180, from 6 years old upwards, and the average attendance is only about 140 or 150. Of those who come only on Sunday a great portion cannot read sensibly, *i.e.* so as to understand what they read; and most of what they do know they have learned at the Sunday school. Those who attend the day school do so very irregularly, and leave at an early age, the greater part at 10 or 11, only a few staying till 13.

Some go off to iron works and coal pits, but the mass, both of boys and girls, go to file cutting, screw and bolt, gimlet, bracebit, or nail making, at their homes or in small shops. The only factory is a paper mill. Some, I should say, begin work at 6 or 7 years old. Many come to school or go to work just as general trade or the private work of the family happen to vary. Some come to school for a few weeks or days, and are then absent for a few weeks or days. This quite prevents anything like satisfactory progress, and in many cases anything worth calling education at all. Many, when they finally leave school, are quite unable even to read, and of course to do anything more advanced.

They are not likely to make this up afterwards. Boys over 13 do not come to Sunday school because they are ashamed of being put, as backward, beside children of, say, only 10, and even if they are put in a separate class they are ashamed of this too. And if they were not, there are neither the time nor the means at Sunday school, with so many scholars, to teach even the simple elements to those who need it.

This winter I have started a night school at a weekly payment of 3*d.* each scholar, but otherwise at my own expense, which is considerable, as I furnished books and slates, though not the copy books, and I have already spent 2*l.* in lights alone. There were 60 names down, but the average attendance has been only about 30. The rest fall away when there is much work to be done, as they have to stay at work late. One of the three school nights was Friday, but I found that that did not do at all, as scarcely any came. The girls' school was from 6½ till 9, and the boys from 7 till 9½. It was long, but necessarily, because I must make all read, write, and sum, and could not provide the expense of more teachers. The parents are well able to pay, at any rate, the lowest rate at the day school, viz. 2*d.* a week for elementary teaching, and, with the exception of cases where there are special circumstances or very large families, for the higher grades of 4*d.* and 6*d.* also. Many earn 30*s.* or 2*l.* a week. From talking over the subject of earnings with the scholars lately, I find that a boy of 15 who is a good worker can earn towards 15*s.* a

Metal Manufactures.

Sheffield District.

General.

Mr. J.E.White.

a.

week, and one of 10, 5*s.* or 6*s.*; while girls at file cutting can earn nearly as much as boys. The amount given up by parents in sending their children to school all day would thus be considerable, but with good arrangement they might earn quite as much and get taught too. There is scarcely any work done on Monday by either parents or children, and by many none even on Tuesday morning. By Saturday morning the week's work is finished, or nearly so. I hear the lads say that they shall be glad when Friday night comes, because they will give up work then. I hear all about the work from talking to them.

This irregularity of work is of course a great difficulty in all home occupations. The people here will work all hours, all night if necessary, to finish the work to be taken in on the Saturday. They can then afford to be idle at other times. They generally have their material in plenty of time to begin work with at once, as they either bring it back themselves when they take in their own finished work or have it sent out as early by carrier or on asses with panniers, &c.

If the children worked regularly through the week they could do quite as much work and attend school also like half-timers. Even if it were necessary for them to work all day Friday, which is so busy a day, still the half-time school on the other days would be very valuable.

It would be a benefit if something of the kind could be extended to children engaged in agricultural employments as well. The mind of country boys is so slow that schooling is needed even to fit them for working profitably. The children of even small farmers, of whom there are several about here, are almost more backward than any.

Needles.

296. *Mr. Robert Cook*, needle and hackle pin manufacturer, Hathersage.—We are the largest hackle pin manufacturers in the trade, and make needles also. We thus use a greater number of stones for pointing and grinding than any other two firms in the business. We have 23 stones, and are going to put up 10 more. My father introduced the needle trade here from Redditch 54 years ago. There is a little hackle pin, but no needle making in Sheffield; here there are two smaller firms. With these exceptions, the great, indeed the only seat of the trade in this kingdom, is still in Worcestershire and Warwickshire. Redditch, Alcester, Studleigh, and Astwood Bank are the chief places in which it is carried on. There are, I should say, a hundred manufacturers, great and small, and a population of * 10,000 persons engaged in the trade in that district. It is rare, however, for a person to carry on all the operations of the manufacture on his premises as we do, but work is there often given out to be done by different small masters, of whom some merely point, others harden, others scour, and so on; some employing, perhaps, only two or three workers. Of late, however, the tendency has been to concentrate the work more in large manufactories, and this will no doubt be more the case in future.

We have put up fans and piping to protect the workers from the dust, which would otherwise be most injurious to their health. They are a considerable expense, not merely in putting up, but also in keeping them going. One takes six horse power, and the two others take three horse power each to work them, and this costs 10*s.* a day. But they are so indispensable to health that every manufacturer ought to be obliged to use them.

A 20-lb. "packet" of steel wire loses from 4 lbs. to 5 lbs. in the grinding, and we grind about 100 packets per week, so that from our 23 stones these fans blow out about 74 lbs. weight of steel dust in a day. (Taking 4½ lbs. as the medium, the amount will be 450 lbs. in a week, or 75 lbs. in a day.—J.E.W.) There will be, besides this, a very large quantity of stone dust, the amount of which I cannot calculate exactly (Mr. Cook had guessed it roughly as very far larger.—J. E. W.), carried out by the fans in the same time. Anyone with a delicate chest, on going near the outlet of the flues, begins to cough. The great bulk of this large mound at the back of the works has been thrown out from the flues in two years. At present the dust escapes in the open air and floats away on the wind, which is not desirable. It eats into everything, *e.g.*, the slates of the roof, and even the glass of the windows, so that in time the surface crumbles away and we have to put up fresh. The glass gets so encrusted with steel rust that it can only be cleansed by oil of vitriol mixed with the water used. We think of putting a reservoir of water to catch the dust as it comes out of the flues, and so prevent its escaping. We have tried this plan partially by turning one flue into an open drain of water, and it answers well. The dust should never be allowed to escape, so as to be carried over houses or frequented places.

We have had Worcestershire manufacturers come down here to look at our fans and arrangements. The larger employers there use fans, I believe, but many, especially those who employ just a few hands, do not.

It is quite as essential to use a fan and pipe to carry off the dust made in polishing hackle pins, which is done on a wheel covered with emery. At this work the nostril becomes covered with black. We are, I believe, the only employers in the trade who use a fan for polishing hackle pins. The scouring or polishing of needles is done by placing them in bags and rolling them backwards and forwards in a machine something like a mangle; no dust escapes in this process.

One of our pointers is 16 years of age, and all the rest over 18. It requires considerable skill to hold and turn the needles in the hand properly to grind them.

In the umbrella-iron branch of our manufacture a large number of girls are employed, chiefly in shaping and punching the ribs, &c., with hand flies, but there are several other processes, *e.g.*, tempering, &c., in which men, boys, and girls are engaged.

Wire drawing is a business that we also carry on, as needed for both our needle and our umbrella departments.

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* According to the last census the number of persons in England and Wales engaged in the needle manufacture is 2,334 males and 1,742 females—total, 4,076.—J. E. W.

The FOUNDRIES, MACHINE SHOPS, &c. in LEEDS and other Towns in the WEST RIDING of YORKSHIRE.

Foundries, Machine Shops, &c. in Leeds, &c.

Mr. F.D. Longe.

B.

GENTLEMEN,

1. A LARGE portion of the male population of Leeds, Bradford, Huddersfield, and other towns in the West Riding of Yorkshire are employed in works which are generally designated as Foundries, and in which the following manufactures are carried on:—

(1). Steam engines, locomotive and stationary, railway-carriage wheels, &c.

(2). Self-acting machinery, employed in other metal manufactures.

(3). Machinery used in the worsted, woollen, flax, and other spinning and weaving trades.

2. The women and children of the district are principally employed in the woollen and flax mills, which are already under the Factories Acts. There are, however, several hand-loom carpet and blanket shops in the neighbourhood of Dewsbury in which children are employed, which are not as yet brought under these Acts.

3. In a former report I have submitted the evidence which I took in the iron works and rolling mills of the district.

4. The hands employed in the two first of the above-mentioned branches of the iron or metal manufacture, are chiefly highly skilled workmen, engineers, ironfounders, millwrights, mechanics of various branches, joiners, &c. The younger portion of these hands consist of apprentices, in many cases bound by deed at the age of 14, and seldom taken before 13 years of age at least.

Numbers and ages of children.

5. In some of the foundries, however, or machine shops (as works of this class are sometimes called), the work is very much confined to the manufacture of only one or two kinds of machines used in spinning or weaving mills. In these works a great number of boys between 10 and 14 are employed in doing the more simple work. In a large loom manufactory at Bradford, out of about 300 hands, 70 were boys of ages varying from 9 to 15. (Evid. 27–29). The general age at which boys are taken into the machine shops is between 11 and 12.

6. In nearly all the foundries, boys of 11 or 12 years of age are employed as errand boys, to carry tools from one shop to another. These boys, however, as appears from the returns sent me by employers, would not average more than 5 or 6 per cent. of the hands employed.

Employment of children.

7. The employments in which the younger boys are engaged in these works are (1) running errands, (2) minding self-acting machines, (3) drilling holes in iron or wood, (4) filling combs with teeth. In this last employment the younger children are engaged. There is no skill required. The master of a large card and hackle manufactory expressed his opinion that girls could do this work as well as boys. (Evid. 30.)

Employment of youths.

8. The youths and apprentices are employed in the same kind of work as the adults. The principal employments are filing or fitting, turning cast or wrought iron, minding self-acting machinery, or assisting the founders in the casting shop. With the exception of turning cast iron, the employments in these works are not unhealthy. I believe few youths are employed in that work. (Evid. 21.)

Hours of work.

9. The prevalent evil in these trades, which the evidence I have collected will bring before you, is the system of overwork, which is common in almost every manufactory. The regular hours are generally from 6 a.m. to 5.30 p.m; in some cases to 6 p.m., or 7 p.m. (Evid. 10.) The half hour for breakfast and hour for dinner are very regularly observed. When work is continued to 7, or when the hands are going to work overtime, half an hour is allowed at 5 p.m. for tea. On Saturdays most works close, in some instances at 1.30 p.m., and in others at 4 p.m. It is only in a few manufactories, however, or for a part of the year, that the regular hours represent the actual hours of work. One boy of 16 years of age worked from 6 a.m. to 10 p.m., for about five months together. (Evid. 5.) Another boy of 16 years of age had worked at filing, generally from 6 to 7, sometimes three days running, to 11 p.m. (Evid. 8.) In one of the largest works all the boys had been working to 8 for the last five weeks previous to my visit. (Evid. 12–14, see also Evid. 16, 18, 28, 31, 32.) It is by no means uncommon for the elder boys to work through one, if not two, nights in the week. (Evid. 17.) One case was mentioned to me of a lad having worked from Monday morning to 5.30 p.m. on Tuesday, on Wednesday from 6 a.m. to 5.30 p.m., and then from Thursday morning to 5.30 p.m. on Friday. (Evid. 22.)

10. The employment of filing or "fitting," as it is called, is very laborious. In the machine shops, where the division of labour system is carried out more completely than in the other works, the labours of a large portion of the hands are confined to the self-same work from one year's end to another. In some works the young "fitters" are not allowed to work overtime. (Evid. 2). Although there is nothing specially injurious to the health in most of the operations in which these mechanics are engaged, the system of work evidently shortens the period during which a workman can earn wages as an able mechanic. "When a man gets to 50 or 55 he begins to fall off." (Evid. 22, 34.)

11. So far as overwork is required for the purpose of repairing machinery, on which the employment of other classes of labourers is dependent, there is undoubtedly a good reason for its being resorted to. In the case of a large locomotive engine factory, the employers, who strongly objected to overtime as a rule, had been obliged to work overtime for some weeks, in order to repair engines injured by the frost; many workmen employed on railroads being necessarily kept out of work until they were repaired. Repairs, however, by no means form the principal part of the work in any of these foundries; the fixed machinery in mills and other works being generally repaired on the premises by millwrights and other mechanics kept in regular employment by the proprietors. With the exception of a small portion, the work carried on in all these foundries is the manufacture of engines and machines of all kinds to order. In such cases the main reason for employers accepting orders, which they cannot complete without overtime, is the fear of letting the order go to other works. In this the workmen are not equally interested with their employers. But the increased wage which overtime affords renders it, generally speaking, far too acceptable. A boy, who at 18 years of age was only earning 8*s.* a week at

regular work, had made 16*s.* and 17*s.* a week, when he was only 16 or 17 years of age, by working overtime. (Evid. 5.)

12. All the employers express themselves opposed to overtime. In one large machine and tool factory the employers had managed to carry on their trade for seven years without overtime, except for one fortnight. (Evid. 21.) The manager of these works says, "I should fully approve of a law preventing "overtime, as it is now prevented in the factories." (Evid. id.) Another large employer says, "I should not object at all to a 10 hours' bill, preventing overtime for young persons." (Evid. 7.) One employer suggested as an objection to restricting the hours of work of youths under 18 years of age, that unless they could work the same hours as adults, they would be kept back from learning many kinds of work in which they were now employed with men. He accordingly suggested that it would be better to restrict the hours of work only of boys under 16 years of age. (Evid. 6.)

13. With respect to the boys under 13 years of age, employed in these works, there are, as I have already observed, very few, except in some machine shops. The employment of boys of this age, at mechanics' work, is anomalous, and probably false economy. The operation of filling combs with pins, in which most of the younger boys are employed, might be carried on by relays under the half-time system, or by girls.

14. The majority of the boys who are taken at the age of 13 or 14 as apprentices, have either had the advantage of the schooling secured by the Factories Acts, by having worked as half-timers in flax, worsted, or woollen mills (Evid. 20), or (as in the case of the engine works more particularly) are educated boys of a better class. It is very common for these apprentices to attend night schools at mechanics' institutes, and other schools, whenever their hours of work will permit them. (Evid. 3, 22.) The boys under 13 years of age, employed in these works, have generally escaped altogether the education afforded by the half-time system, as well as that of the ordinary day schools.

15. With respect to the other matters of inquiry, I may state generally, that the workshops are for the most part large, and that the character of the work is not such as to permit overcrowding. The shops are almost all fitted with machinery, on which the boys are sometimes employed, but the shafts and straps are generally so arranged as to be out of danger. Accidents do occur occasionally, but they do not appear to be such as could be attributed to the unnecessary exposure of dangerous parts of machinery. The employment of young boys on dangerous machines is to a great extent prevented by the interest, as well as the humanity of the masters, as the boy is as likely to damage the machine as his fingers.

Other trades connected with the iron manufacture in Leeds, &c.

16. There are a variety of other trades connected with the iron manufacture, carried on in Leeds and the neighbouring towns—in small works and shops—such as the manufacture of spindles, screws, nails and bolts, spades, &c. In very few of the works, however, are there any considerable number of hands employed.

17. In one of the largest spindle manufactories in the district, out of 200 hands there were about 12 boys under 13 years of age. (Evid. 34.) But the process of manufacture requires too much skill to afford employment for boys under 12, or at least 11 years of age. (Evid. 37.) Overtime in these shops is not so common as in the machine works. (Evid. 34–35.)

Employment in the screw works.

18. There are a few cut-nail and screw works in Leeds. The character of these works and the system of employment is the same as in the screw works of the Wolverhampton district. The children and women employed in these works are generally of the same class as those who are employed in the flax and woollen mills. Although the employment is very dirty, it is considered far more healthy than the work in the flax mills, owing to the absence of dust.

Employment of children.

19. In the screw works a few boys and girls under 13 years of age are employed. An employer states, with regard to children of this age, "I do not think that we should have any difficulty in employing two sets of children under 13 years of age, as in the mills." (Evid. 39.) They are generally employed either in the warehouse, or, if put to making screws, they work the hand screw, and being paid according to the quantity they make they are not in the same danger of being overworked as when their labour is regulated not so much by their own strength as by the motion of the machine with which they have to keep pace. One little boy of 12 years of age stated that he was more tired after six hours' work in the hackling room at a flax mill, than after making screws from 6 a.m. to 8 p.m. (Evid. 40, 43.)

Dangerous machinery.

20. The machinery worked by steam-power in some of these shops is of a very dangerous character. The legs and arms of the workers are always in close proximity to wheels and straps revolving with the greatest rapidity. Although the large fly-wheels and a few other dangerous parts are guarded, the safety of the workers is for the most part dependent on great caution on their part, and on the employers taking care not to put young or careless children to any of these machines. (Evid. 42.)

I have, &c.
FRANCIS D. LONGE.

EVIDENCE.

AT MESSRS. WARDLE AND MANNING'S, ENGINE WORKS, HUNSLET, LEEDS.

1. *Mr. C. W. Wardle.*—I think a law preventing the employment after 6 o'clock of all lads under 18 years of age might be carried out in our works. I do not think we should suffer. It would be a good thing for the lads. All the lads in these works, except the riveters, are apprentices. They are taken at 14 years of age. They get 4*s.* a week to begin with, and their wages rise 1*s.* a week each year until they are 21. Young journeymen earn from 1*l.* 1*s.* to 1*l.* 5*s.*

2. *Mr. Mackintyre*, manager.—We employ no boys under 14 years of age in the regular work. There may be a few exceptional cases where boys are taken at 13. It is a rule in our works that all boys who attend night school should be allowed to leave off work in time on those days if we are working overtime. We object very much to overtime for any of our hands, but we are obliged to have recourse to it in consequence of the fluctuation and peculiar character of our orders. For instance, lately, owing to the frost, we have had a great many locomotives to

Foundries, Machine Shops, &c. in Leeds, &c.

Mr.F.D.Longe.

b.

repair for railway companies. Many of the men employed on these railroads were being kept out of work until the engines were repaired. The lads who work overtime are employed in attending self-acting machines. There is little labour attending this work. We do not allow our young fitters to be employed overtime.

3. *Edwin Waller.*—I am 15. I have worked here a year and nine months. I come at 6 o'clock. I go away at half-past 5, and sometimes I stay to 8. I have worked to 8 on Mondays, Wednesdays, and Fridays. I used to go to the School of Arts on those days. I always give over at 1 o'clock on Saturdays.

4. *William Gale.*—I am going 17. I have worked here two years. When I first came I minded a machine. I made 60 hours a week. Sometimes I worked to 8. I never worked after 8. I am now working as a fitter. I have never worked more than 10 hours at filing in a day. I used to work at a mill. I was a short-timer, and then worked as a whole-timer for a year or so.

5. *John Burnley.*—I am 18 and a half. I worked at another place before I came here. I was about 16 when I began to work there. There were 15 apprentices in one shop; we worked from 6 in the morning to 10 at night for about five months. We were working at railway wheels. We were paid overtime. All the boys liked to work overtime. I used to make 16*s.* or 17*s.* a week there. It was too much work. I only make 8*s.* a week here.

AT MESSRS. KITSON AND CO.'S, LOCOMOTIVE WORKS, HUNSLET.

6. *Mr. Kitson.*—I have always been a great advocate for the education of the younger members of the working classes, and I took a leading part in favour of the Factories Acts 30 years ago. In my own works there are no boys under 13 or 14 years of age, indeed very few under 14. There is no work at which younger children could be properly employed. The only question, therefore, affecting my trade, would be the limitation of the hours of work for young persons under 18 years of age. I am of opinion that such a limitation, although it would undoubtedly be very advantageous for the youths, would have the effect of interfering with the freedom of the adult workmen, with whom they work as assistants, and it might cripple us materially in getting our work done. I am strongly opposed to systematic overtime, but I do decidedly consider that trade requires that we should be able to have recourse to overtime occasionally. Such a restriction on the working hours of youths between 16 and 18 would also have the effect of keeping them back in their education as artizans. There is much work to which older boys are put which they could not be put to if they could not work after 6 o'clock, so that they could not learn this high-class work until they were 18 years of age. Supposing the age was 16 and not 18, this objection would not apply so strongly. Most of the boys in my works are apprentices. We prefer lads who have been to school until they come to us. Except for riveters, we take boys of a higher class than those who have been at mills.

AT MESSRS. NEWTON AND CO.'S, FLAX AND TOW MACHINE MANUFACTORY, WATER LANE, LEEDS.

7. *Mr. Newton.*—We manufacture machinery for spinning mills. No women are employed at all in our works. Our rule is to take no boys under 14 years of age. We are very particular about this, and require the boys to produce a certificate of their age. We have about 60 boys between 14 and 18 years of age. Our regular hours are from 6 to 6, but we work overtime, and these boys sometimes work to 7, 8, 9, or 10 o'clock. I should not object at all to a 10 hours bill, preventing overtime for young persons. We dislike overtime, but we have been obliged to have recourse to it lately. There has been a good deal of work in the machine shops here for the last six months. We have had to work all night several times. We never work all the hands overtime at once. Overtime is generally only to 8. Of course if we were put under such a law, machine shops in Ireland and Scotland must be brought under it too. The hardest work is forging, casting, and filing. There are no boys employed in the forging department. About 8 boys are employed in the casting shops, and about 35 boys work at filing. Filing is the hardest work of all. Turning cast iron is unhealthy work.

8. *John Thomas Graham,* fitter.—I am going 16. I have worked here about a year. I come at 6. I go away at 7 or 8 at night. I have generally gone away at 7. I once worked all night. I have often worked to 11 o'clock. I have worked three days running till 11. I get 5*s.* a week. I have never got so much as 7*s.* We give over at 4 o'clock on Saturday.

9. *Charles Waincop.*—I am 15. I have worked seven months here. I am a fitter. I file all day. I begin at 6. I generally give over at a quarter to 6. I have stopped to 9 sometimes. Once this week I stopped to 9. I often work to 8. I never worked a whole week to 8. I have worked a whole week to 7. I got 5*s.* 4*d.* for that week.

AT MESSRS. SAMUEL LAWSON AND SON'S, FLAX AND HEMP MACHINE MAKERS, HOPE FOUNDRY, LEEDS.

IN THE SCREW SHOP.

10. *John Sykes.*—I am 15 next July. I turn screws. I have been here one year and a month. When I first came I nicked screws. I come at 6 and go away at 7. Those are my regular hours. The machine which I work at stops half an hour at breakfast, an hour from 12 to 1, and half an hour at 4½ to 5. I worked to 8 for one month before Christmas. I have never worked after 8. Since I have been here I have not known of any boy being hurt much in this shop. There was one case in another shop that I heard of. James Weller had his fingers cut off in a cog-wheel. Before I came here I worked for a farmer. I kept cows. I got no wages, but only my food and my clothes. I began to work when I was 10. (Can read.)

11. *Tom Smith,* driller.—I have just turned 12. I have worked here eight months. When I first came I filled. (Put pins into gill stocks.) Now I drill gill stocks. I have drilled three months. I get 3*s.* a week. I got 2*s.* when I first began. I can drill more holes now than when I began. When I first began I used to break my drill three or four times a day. I got scolded. Now I break it sometimes, but not so often. I used to spoil the stock too sometimes. I always go away at 7. I never stop after 7 now. (Cannot read.) I worked in two paper mills and a cloth mill before I came here. I have two sisters and two brothers. I never hurt myself. I never saw a boy hurt in this shop.

AT MESSRS. SMITH, BEECROFT, AND TANNETT'S, MACHINE TOOL MANUFACTORY, HUNSLET, LEEDS.

12. *Thomas Lindley,* mechanic.—I am 16. I have worked here three years. I come at 6 in the morning and go away at 5½ in the afternoon. Overtime is to 8 o'clock. I have worked overtime five weeks lately. I never worked overtime before. I never have worked after 8 o'clock. On Saturdays we always give over at 4 o'clock.

13. *Alfred Shaw Turner.*—I have been here 11

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months. When I first came I run errands. I have been about six months at a turning lathe. I got 2*s*. 6*d*. when I first came, and I get the same wages now. I begin at 6 and give over at 5½. I have been working overtime to 8 o'clock for the last five weeks. I never worked after 8. I get 5*d*. a week more for the overtime. I went to school before I came here. (Can read.)

14. *George Green.*—I am going 13. I have worked here one month. I tool-look. I work overtime the same as the others. I have never worked after 8. I drilled holes at Wordsworth's with another boy before I came here. (Can read.)

15. *Joseph Airly.*—I am going 17. I have worked here ever since I was 13. I have never worked through a night. I have worked to 8, but never after. I go to night school twice a week.

AT MESSRS. BUCKTON'S, MACHINE TOOL MANUFACTORY, HUNSLET, LEEDS.

16. *Mr. Buckton.*—Out of 356 hands on our works there are seven boys under 14 years of age, one of whom is not yet 13, and 50 under 18 years of age. Our regular hours are 10 hours a day, *i.e.* from 6 a.m. to 5½ p.m., with an hour and half out of that time for meals. On Saturdays work ceases at 4. We require a register of birth with all the boys we take. We have no regular overtime, but it occurs sometimes. If we have some particular work which we require to have finished in a very short time the hands engaged on that work, including the elder boys, might work through two nights in the week. Boys under 18 may have worked through two nights in a week, but it is an extraordinary occurrence. They would not generally be kept on after 8 o'clock.

17. *Edwin Rushworth*, fitter.—I am going 23. I have worked here ever since I was 15 years old. I generally work 10 hours a day, *i.e.* from 6 to 5½. I have worked through two nights in a week. I never did that two weeks running. I have only done it once. I worked four times through one night in a week. It is generally Friday night that we work through. We always give over at 4 on Saturdays. I never worked after 4 on Saturdays. I was 18 or 19 when I worked through the night. I don't think I ever worked through the night before I was 18. I can't call to my mind any case where a boy under 18 has worked through the night. I have worked to 12 o'clock two or three times. I don't think I have worked six times so late as that.

18. *Mr. Joshua Jackson*, foreman of the fitting department.—There are two boys under 18 working with me. Neither of them have ever worked after 8 o'clock. We generally give over at 5½. When we do work at night we don't work the boys. They do not work after 8 o'clock.

19. *Benjamin Barker*, foreman in the casting shops.—I have seven boys in the casting shops. I believe only one of these boys has been at a mill. I would rather have boys who have never been at work before they come to me. When boys have been some time learning the work of one trade they don't take to another trade so well. I like boys to have learning when they come. I like them to be well educated.

20. *William Strother*, foreman of machine department.—At the end of September in last year we were more pushed for work in getting orders finished for the Baltic than we have been for a long time. During that time boys under 18 worked to 10 for a week together. I am quite sure that no boy of that age worked two nights in a week for two weeks running, nor more than one night in a month. No boys worked so late as 12 for so many as four days in a week. We don't like overtime. Foremen get no extra wages for looking after the hands when they work overtime. I have always to stay to 8 o'clock when they work overtime. Of the boys in my shop about one quarter have been at mills before they came. Some of the boys from Marshall's have turned out very fine boys. I should prefer a boy who had been at a mill if he had schooling as well. They have got accustomed at the mill to the working of machinery. Their work in the mills makes them know something about the machines which they have to do with here.

AT MESSRS. TAYLOR, WORDSWORTH, AND CO.'S, MACHINE AND TOOL MAKERS, HUNSLET, LEEDS.

21. *Mr. Benjamin Pollard*, manager.—We don't take any boys to work at regular machine work until they are 14 years of age. We have only three boys under that age in the works altogether. Our regular hours of work are for five days in the week from 6 a.m. to 6 p.m., with half an hour for breakfast and one hour for dinner. On Saturdays we close at 1½. We have only worked overtime for about a fortnight during the last seven years. I should fully approve of a law preventing overtime, as it is now prevented in the factories. Our principal work is making wool-combing machines. All these machines are made to order. Our customers often try to hurry us, but we will not work overtime. We can make a wool-combing machine in about a fortnight. Turning cast iron is very unhealthy work, from the dust of the cast iron which is inhaled by the workman. No lads work at cast iron. Turning wrought iron is quite healthy; there is no dust thrown off. Brass turning is also unhealthy, but the persons employed at this are nearly all men. I do not think we should ever want overtime, even in case of an accident to our machinery.

AT MESSRS. MATTHEW RHODES & SONS, MACHINE TOOL MAKERS, NEW LANE, LEEDS.

22. *Mr. M. Rhodes.*—Our trade is to make the self-acting machines for making spinning machines, &c. I have only a few hands as yet, and no boys under 13. It is only in larger works where there are several rooms that errand boys are wanted to take the tools from one room to another. The youngest lad we have is 16 years old. He is a turner. The regular hours in our trade are from 6 to 5½. I was a journeyman mechanic myself. I have worked at Kitson's, at Smith, Beecroft, & Tannett's, and at Fairbairn's. We work much too long in our trade. I once worked from Monday morning to 6 o'clock on Thursday night, without stopping more than 3 or 4 hours. That is not a common occurrence. I never heard of any one else who worked so long as that. I was not working piece work. I was 21 years old then. I left Smith, Beecroft, & Tannett's before I was 21. I was getting 24*s*. a week for regular time. Before a man is 21, however good he is, no master will give him full journeyman's wages. We have a boy with us of about 18 years of age. He was getting 8*s*. a week at one place; he gets 9*s*. here. He is as good as a man. As a rule, lads who are not earning full wages would not be asked to work so long as journeymen. Many journeymen like working long, because they can earn such high wages. I have made an agreement with the lad of 18 whom I have just taken, that he shall always be able to attend his school three days a week. The utmost night-work I have ever known a lad under 21 do, was this:—From Monday morning to 5½ on Tuesday afternoon; on Wednesday from 6 to 5½, and from Thursday morning to 5½ on Friday, and on Saturday from 6 to 4. This lad was about 19 or 20. I should certainly like a law to prevent lads working through the night, but I think they ought to be allowed to work to 8. When I was a boy under 18 I never worked through two nights in a week, and I do not think it is at all often done. The errand boys at machine-tool shops do not, as a rule, work after 5½. Occasionally they might be asked to

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work to 8. But I should say they never did such a thing as work through the night. In machine-tool shops the hands always give over at 4 o'clock on Saturdays. It is a very strong point with men stopping early on Saturday. Our engine stops regularly at 8 o'clock for half an hour at breakfast, and at 12 o'clock for an hour for dinner. If we are working overtime it stops again at 5½ for half an hour. Overtime is generally to 8 o'clock; overtime to 10 o'clock is not common. When work is going on to 10, boys under 18 would work that time just the same as the men. I have known boys of 15 to 18 years of age work 5 nights a week to 10 o'clock for 2 or 3 months together. Errand boys would not work to 10 o'clock. I began to work at 12 years of age at a tanner's in Swinegate. At 13 I went to Smith, Beecroft, & Tannett's as an errand boy.—I jobbed there for 6 months. Then I began turning. I turned for four years and a half. I never worked to 10 all that time. The wages of men in machine shops average about 1*l.* per week. A man of 21 can get 1*l.*; a very good man of 30 can get 28*s.* When a man gets to 50 or 55 years of age he begins to fall off.

AT MESSRS. SCRIVEN & HOLDSWORTH'S, LEEDS OLD FOUNDRY, LEEDS.

23. *Charles Richardson.*—I have worked here two months. I come at 6 and leave at 8. I am 18 years old. I have worked all night for two nights since I have been here. I worked last Friday night, and the Friday night a fortnight before. I began at 6 on Friday morning, and worked to 4 o'clock on Saturday. I never worked after 4 on Saturday. I have worked to 10 on one night. We get extra wages for overtime from 5½.

24. *Edward Hutchinson.*—I am 13. I have worked here three months. I come at 6. I go away at 5½. I have stopped to 8. I never stopped after 8. I stopped to 8 the second night after I came. Then I stopped to 8 o'clock three nights in one week; and since that I have only stopped once to 8. I job about. I carry the workmen's tools from one shop to another. I do no regular work, such as filing. I get 3*s.* a week. I get 6*d.* a week for overtime. I never worked in a mill. (Can read.) I learnt to read at St. Mary's. When I worked to 8 I was not tired.

25. *Richard Jones.*—I am 17 years old. I am a turner. I have worked here three years and two months. When I first came I jobbed about. I come at 6. I usually work till 8, *i.e.* two hours' overtime. We always work two hours overtime. I have worked to 10. I have only once worked all night. I never worked after 4 on Saturday. When I worked all night it was on a Thursday. Master wanted to send off a machine on the Friday, and all it wanted was the work I had to do. I did the work in the night, and the machine was sent off in the morning. I only worked till half-past 5 the next day.

26. *Mr. Charles Scriven.*—We never require the errand boys to work after 8 o'clock. When our men work at night we get their tools ready for them. I should not at all object to the extension to our trade of the rule of the Factories Act which prevents the employment of young persons under 18 after 6 o'clock at night. If the age was 16 it would be better.

AT MR. G. HODSON'S, FLAX MACHINE MANUFACTORY, BRADFORD.

27. *Mr. J. Hodson.*—We employ over 300 men and about 70 boys. Our work consists principally in the manufacture of one class of looms. There are other manufactories of the same kind in Bradford, but they do not all employ boys. The youngest boys we have are about 9 or 10. They square centres and drill.

28. *William Feather.*—I am going 14. I have worked here four years. I am going to be a fitter. I never went to school. I never went to a mill. I have no father. I come at 6. I work to 6½. That is my regular work. After that it is overtime. I have worked to 3 in the morning. I have often worked to 10 at night. I don't know whether I have often worked after 10. I never worked more than twice a week to 10. I always work to 9 when I can get work to do. I got 7*s.* last week. I have only one sister at home. Mother weaves. I never work through the day without stopping for dinner. I always stop an hour. I always stop half an hour for breakfast and half an hour for tea. I get 6*s.* when I only work to 6 o'clock. I only worked two nights last week to 9. I have worked a whole week to 9. I never worked a whole week to 10. I go away on Saturdays sometimes at 12 o'clock, and sometimes at 4. On Saturday I stopped to 7. I never stopped later than that on Saturday.

29. *John Booth.*—I am 11. I have worked here one year and four months. Before that I went to school. I was in the 6th class at school. I never went to a mill. (Cannot read.) I slide. (Minds a self-acting machine.) Since I have been here I have only seen one boy hurt by the machinery. I come at 6 and I go away at 6. Sometimes I stay till 9, sometimes to 7. I never worked five days running to 9. The machines stop at breakfast and dinner time; and when we work to 9 they stop at tea time. We do not all stop to 9, though the machinery goes on.

AT MR. T. B. HARDING'S, CARD AND HACKLE MANUFACTORY, HOLBECK, LEEDS.

30. *Mr. T. B. Harding.*—We make all kinds of combs with steel teeth for combing wools, flax, and cotton. In the work of our manufacture, children are employed in making and filling the combs; more particularly in making wooden and brass gills, cards, &c. Girls could do the filling work just as well as boys, but we do not employ any girls. Boys of 9 years of age could do much of this work, but I do not think we have any boys under 9. We should like to have some under 12 if we could get them.

31. *William Webster* (employed in making cards).—I am going 12. I come at 6 in the morning and go away at 8 at night. I have worked to 8 all this week. I go away for dinner, breakfast, and tea. I was a year at school before I went to work. I drive cards.

32. *Randolph Smith.*—I am going 11. I have been two weeks here. I was six months at Marshall's school. (Can read.) I never worked in the mill. I never worked till I came here.

33. *George Lesley.*—I am going 14. I have worked here three months. I come at 6. I go away at 8. I always stop to 8. I worked at a mill as a half-timer for eight months. (Cannot read.) I drive cards.

AT MR. HATTERLEY'S, SPINDLE MANUFACTORY, WORTLEY ROAD, LEEDS.

34. *Mr. Hatterley.*—Out of about 200 hands we employ about 12 boys under 13. I believe those boys are all 12 years old. Assuming that we could easily get double the number of boys of this class, equally able to do the work, there would be this difficulty in employing the two lots:—Accuracy of work is of the greatest importance, all the work done by these boys is examined before it is passed on to the next set of hands, the work can only be examined after it is finished by the boys. Supposing two boys were concerned with each piece of work, it would be practically impossible to ascertain which of the two was responsible for any bad work that might be done, unless, indeed, we increased the number of foremen, and had

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men always looking after the boys to see how each did his work. Our regular hours are 10 per day, *i.e.*, from 6 a.m. to 5½ p.m., with one and a half hours for meals. We always close at 4 o'clock on Saturdays. We do not work overtime more than two months in the year. Our overtime is two hours per day for five days in the week, *i.e.*, to 8 o'clock. We never work overtime on Saturdays. The difficulty in the way of stopping all overtime for boys under 18 in our work would be that it would stop the men's work as well. The men take the work from the boys, and are dependent upon their work for their own work. They could not go on for an hour after the boys had ceased to work. Our work is all divided between different hands, each man being dependent upon the man or boy who works before him. The boys who work for us as a rule learn the whole trade, and become journeymen spindle makers. They begin with us at 5*s.* a week. If they worked piece work they would make 5*s.* At 14 years of age they get 4*s.* and so on up to 20, when they get 10*s.* A journeyman of 21 gets 20*s.* The average wages of a spindle maker are 24*s.*; they vary from 24*s.* to 30*s.* For the last five years, the best men have, I believe, been getting as much as 30*s.* a week for the whole year round. Men of 22 years of age are prime workmen. They begin to fall off at 50.

35. *William Briggs.*—I am going 15. I have been here four years. When I first came I cut heads for a fortnight. I then glazed for eight months. For the next three months I did various jobs. I never was at the same job for more than one day at a time. I then went to filing. I was four months at that. Then I went to straightening. Then I went to drilling. I was two months at drilling. I got 4*s.* a week at drilling. I was then shifted to a higher job; it was turning. I am still turning. Drilling was very easy work, but it stalled me. The work was the same morning and afternoon, and day after day. Now there are four women who do the drilling. Before I came here I went to a mill. I worked here for a fortnight at one mill at warp-dressing. I then had to leave because the doctor would not pass me as a whole-timer. I got 5*s.* a week when I was there. Half-timers could not be employed at that work, because it took three hours to finish a warp, and each man must finish his own warp. (Can read.) I can write. I learnt to read and write before I went to the mill. I was two or three years at school. I go to night school now. I go on Tuesdays and Fridays from 7 to 9. I have gone only one month. I have worked overtime two hours a day, except Saturdays, for about three or four months in a year since I have been here. I used to glaze; there is not much dust from glazing. No boys ever grind. I have no father. Mother and I are the only two at home. Sister lives with us but she pays for her lodgings. Mother gets 7*s.* a week, and I get 6*s.* or 7*s.* without overtime.

36. *Joseph Birkett.*—I am going 16. I have worked here for three years. I am turning now. When I first came I heated fliers at a furnace. Then I straightened. Then I went to turning. (Can read and write.) I dressed warps before I came here. I worked on the mill for two or three years. There were two of us. We worked as half-timers. We got so much for a warp, and divided the money between us. They have two short-timers there still, but no boys. I had been to school before I went to the mill. I could read before I went. I got 2*s.* and 4*s.* a week. I have three sisters and one brother at home with father and mother. I am the only one that works. I gets 4*s.* a week. When I work piecework I can get 6*s.* or 7*s.* Mother weaves. Father is a turner. He gets 18*s.* a week.

(I examined 12 boys, nine could read and three could not. Of those who could read five had been to mills.)

At Mr. W. Greenwood's, Spindle Manufactory, Gibbet Lane, Halifax.

37. *Mr. W. Greenwood.*—We make spindles for spinning machines. The shop in which we carry on our trade is the ground floor of a building, the upper floors of which are used as a worsted mill. Our shop is not under the Factory Acts. We never take any boys under 13 or 14. A boy of 12 would not do for our trade. He would not have knowledge enough. All our lads are bound apprentices at 14. Our hours of work are 10½ hours per day, except on Saturdays, when we close at 1 o'clock. If the men work to 2 we pay them overtime. We have one hour in the week less than the factory hours. The men have forced us to work short hours. We never have any overtime, except the hours from 1 to 2 on Saturday. No boys work at the grinding. All our stones have fans fitted to them.

38. *Matthew Crossley.*—I am going 20. I was 15 when I came here. I am a bound apprentice. I worked at a worsted mill at 8 years of age until I was 13. I then went on as a full-timer. I can't read so much now. I learnt to read when I went to school.

At Mr. L. Pool's, Screw Works, Sweet Street, Holbeck, Leeds.

39. *Mr. J. Poole.*—We employ about 130 hands. Of these about 30 are women, about four of these would be girls under 13. The rest of our hands are men and lads, employed in forging and finishing the screws. The screwing is done by machines worked by steam power. There are two or three little boys under 13 who attend these machines. Our regular hours are, for women, 10 hours a day. On Saturday they leave off at 1 o'clock. We generally give over altogether at 6 o'clock. Sometimes we have overtime to 8 o'clock for a month or two, when trade is very good. We now have nine screwing machines going on all night. We have an additional lot of hands, men and boys, to work these machines. Two sets work alternate weeks by night and day. We had to teach this extra set of hands. It took us six months to get all these hands into work. As soon as we have got sufficient room and additional machinery we shall employ all these hands in the day only. I do not think we should have any difficulty in employing two sets of children under 13 years of age, as in the mills, the work the little ones have to do is very simple. But we employ so few children of that age at all, that we could easily do without them if we found it inconvenient employing the two lots.

40. *James Bellhouse.*—I am going 13. I have worked here half a year. When I first came I topped nuts. I got 3*s.* a week. I now screw bolts with a hand screw. I was in the warehouse for three months; ran errands and did many things. I was at Marshall's mill for a year. I was at school before I went to Marshall's. I worked in the heckling room. I only worked half time. It was bad dusty work. I got 1*s.* 10*d.* and 1*s.* 11*d.* a week. (Can read.) I come at 6 and go away at 8 at night. I have worked to 8 ever since I came. I was more tired when I worked at Marshall's than I am now. I had to keep filling holders. I only worked six hours there, I know, and went to school in the other part of the day. I am quite sure I was more tired by my work there than I am here.

41. *William Henfer.*—I am going 13. I have worked here a year and a half. I went to school before I came here. I used to work in the warehouse. I can read. I read the Bible and Testament at home. I have read a little book called "Cain and Abel." I come at 6. I go away at 6. I worked to 8 last night. It is a long while since I worked to 8 before that. I chop. I get as much as I addle. I have had my fingers cut. I was only laid up for a day and a half.

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Peacock chopped his fingers off in the hand shears. C. Crossley cut his arm in the cutting machine. He had no business there at all. He was meddling with another boy's machine.

42. *Mr. J. Poole*, continued.—It would be wrong to put a boy to any of these machines before he is 12 years old. As it is, we sometimes have to take away lads who are careless. It would be a great shame to put boys to them who are too young. No boy is allowed to touch the wheels or oil his own pulley. There is a man whose duty it is to oil the machinery and put on the belts when they get off. We have never had any accident from the wheels, or the bands, or the shafts in my time. We have guarded all the parts of the machinery which we consider dangerous.

43. *Angelina Longbottom* (about 14 years old).—I worked at Marshall's mill when I was 12 years old. I went to school when I was 7. I had learnt to read before I went to the mill. I worked in the hackling room at filling holders. It was hard, dirty work. When I was 13 mother would not let me go on. I then broke flax. I got 5*s.* a week. It was over dusty. I couldn't stand it. I then went to a woollen mill. I began to learn to piece at the woollen mill. Then I came here. I think I can get 6*s.*

44. *Mary Anne Coile*.—I am going 12. I have been here a fortnight. I got 3*s.* 9*d.* last week. I have not full work to do now. I used to work at Marshall's. I addled 1*s.* 9*d.* and 1*s.* 8*d.* there. I was nearly a year at school as a half-timer. I was going 11 when I first went to school. I learnt to read. (Cannot read; cannot spell Leeds.)

45. *Edwin Hunter*, screw forger.—Our bellows are all worked by steam. Each man has a striker. In little shops boys blow the bellows. When the bolts are very small the blast cannot be used. If the blast was going on while the man was forging one bolt the iron and coal would be wasted.

AT MR. BRADBURY'S, SCREW AND SCREW BOLT MANUFACTORY, SCHOOL CLOSE, LEEDS.

46. *Thomas Smith*.—I am 13. I shall be 14 next September. I have worked here since last November. I come at 6 in the morning. I go away at 9 at night. Sometimes I work till 10. I generally work one night a week to 10, two nights to 8, and the other two nights I leave off at 7. On Saturday I go at 4. I get 3*s.* 6*d.* weekly wages. It is not very hard work I have to do. I generally go away for dinner. I do not go for breakfast. I always stop half an hour for breakfast, and one hour for dinner, and half an hour for tea. I was a half-timer at Marshall's flax mill for three years. I can't read much. The work at Marshall's mill was hard work, and the dust made me badly. I filled holders.

(The shop in which this boy and a few others were working was very small, dark, dirty, and dilapidated.)

AT MESSRS. BURRELL AND CO.'S, SPADE AND SHOVEL MANUFACTORY, ARMLEY ROAD, LEEDS.

47. *John E. Scott*.—I am going 13. I have worked here two years. I began at fenders. (Can read.) I went to school for a good bit before I came to work. I go away at 6 at night, except when we have overtime. I get 2*d.* extra for overtime to 8 o'clock. We work to 8 about two or three days in a month.

IRON SHIP-BUILDING YARDS and ENGINEERS' WORKS.

TO HER MAJESTY'S COMMISSIONERS.

Iron Ship-building Yards and Engineers' Works.

Mr. F. D. Longe.

C.

GENTLEMEN,

I HAVE visited several iron ship-building yards on the Clyde, near Glasgow, at Stockton, and on the Thames near Greenwich, and beg to forward the evidence which I have taken in some of these yards, together with some evidence which I have taken in some engineers' works in London.

2. There are two classes of boys employed in these works. (1.) The apprentices, who are generally a well-educated and somewhat superior class. (2.) The riveters' assistants, who are for the most part under 14 years of age, and often uneducated and badly cared for. In all works where the putting together plate-iron constructions, such as boilers, bridges, girders, and iron ships, is carried on the riveting forms one of the principal operations; a vast number of young boys are employed in this work. I have already noticed them in a former Report on Iron Foundries.

3. Although there are many boys of nine years old employed by riveters in the ship yards, and in the higher class of engineers' works, there are but few boys employed under 11 years of age. (Evid. 2, 4, 10, 15, 11, 13.)

4. A great objection to the employment of young boys in the ship yards is the dangerous position in which they have to work in the process of building iron ships. In other respects this employment is easy and healthy. The boys heat the rivets in a little furnace placed near the workmen, and carry the red hot rivets to the riveters. Boys seldom stay at this work beyond 14 or 15 years of age, when they become apprentices, or leave for other employments.

5. The regular hours of work in these ship yards and other works are from 6 a.m. to 6 p.m.; in many cases to 5.30 p.m. On Saturdays work generally ceases at 4 p.m. In all these works, however, the practice of working overtime for weeks and months together is very prevalent. The apprentices and riveters' boys work as long as the adult workmen. In many cases I found that the riveters' boys had been working from 6 a.m. to 8 p.m. regularly for many weeks. (Evid. 5, 7, 9, 11, 12, &c.)

I have, &c.
FRANCIS D. LONGE.

EVIDENCE.

Messrs. M. Pearson & Co., Iron Shipbuilders, Stockton.

Iron Ship-building Yards and Engineers' Works.

Mr. F. D. Longe.

c.

1. *Sidney Smith*, foreman of the ship yard.—The men who are chiefly employed in making iron ships are "platers" and the "riveters." Each set of riveters have two boys to heat the rivets for them. The boys are paid by the men when they are on piece-work. They are generally between 10 and 14 years of age. At 14 years of age these boys are, most of them, apprenticed to the trade. I believe nearly all these boys can read and write; they have all to write on the time-board the particulars of their day's work. We keep another account to check them. They nearly all write for themselves; the boys often write for the men.

2. *James Little*, heater for riveter.—I am going 11. I have worked here going two years. I went to school before I came here. I can read. I read the Bible and little books. I come at 6 and leave at 6. I never worked after 6. I go home to dinner. I get my breakfast here. I blowed when I first came. I get 4*s.* 6*d.* a week on time, and 6*s.* on piece. I like working on piece better than on time, because I get more wages. It is not hard work. I give my money to my mother. I have four sisters. Two of them work in the pottery.

3. *William Anderson*, boltsmith and rivet-maker.—I employ a lad as a striker. We never have boys to blow the forge fire. We have no bellows, but the fire is kept up by the blast. I have always used the blast for making the smallest bolts. There is no waste of iron or coal in using the blast. The man must mind his work, that is all. He must have one boy and work quick. If I had no blast, and had to blow my own fire, it would be very slow work.

Messrs. Brown & Co., Iron Founders, &c., Stockton.

4. *Henry Kirk*, rivet heater.—I was 11 years old last New Year's day. (N.B.—His father stated that he was 14.) I have worked here three or four months. I heat rivets. Before I came here I worked as a call-boy on Dixon's steamboat. I come at 6 o'clock, and go away at 6 in the evening. Sometimes I stop later. I have worked all night twice in my life. I was working for men who were repairing a boiler then. I work overtime sometimes, but not often. I worked a quarter of a day overtime for four days last week. That is all the overtime I have ever done.

Messrs. Rennies, Engineers, Albion Works, Blackfriars.

5. *James Morris*, apprentice pattern-maker.—I was 16 last month. I have been 17 months. I was at school till I came. I can read and write. I have learnt arithmetic. I am learning mechanical drawing, and I go to school at nights now at 8 to 10. I go twice a week. I come at 6. I have come at 5½. I have worked two or three weeks to 8. I never worked after 8. I leave at 4 o'clock on Saturdays. I leave for dinner and breakfast.

6. *Joseph Wingate*.—I am an apprentice engineer. I have been here nine months. I am 17. I was at school till I came. I come at 9, and leave at 5½. I go to King's College three times a week from 7 to 8.

7. *Mr. J. Jones*, foreman of the fitters.—We have apprentices from 14 years of age. We never take them under that age. We don't take them often under 15 or 16. Our regular hours are from 6 to 5½. We often have overtime to 8. Sometimes we have no overtime for six months, and then we work overtime for six months together. Apprentices are only bound to work 10 hours by their deed. We have one apprentice who never will work overtime. Generally speaking they work when they are asked. The apprentices only work overtime when they are working at the machines, not when they are fitting.

Messrs. Rennies' Boiler Works, Greenwich.

8. *Thomas Stephenson*, riveter's assistant.—I am 16. I gather rivets. I have worked here four years. I was errand boy at first. Before I came here I was at school. I was about six or seven years at school. I can read and write. I have learnt up to reduction in arithmetic. I come at 6. I go away at 8 at night. I never stop after 8. I always stop to 8. I have done so ever since I have been here. Master pays me my wages. I go away to breakfast for half an hour, to dinner for an hour, and for half an hour at half-past 5 for tea. On Saturdays I leave at 6 o'clock. I get 7*s.* a week.

9. *William Lafling*.—I was 14 last Tuesday. I carry rivets. I have worked here about six weeks. Before I came I worked in the boat yard. I was two years there. Before that I was at school. I was about eight years at school. I can read and write. I go to Sunday school now sometimes. I don't go regularly. I read the Bible and Testament at school. I never read the newspaper. I don't know much arithmetic. I come at 6 in the morning. I leave at 8 o'clock at night. When I was in the boat yard I worked from 6 to half-past 5, and sometimes to half-past 7. I always leave at 4 on Saturdays. I always go away for breakfast, dinner, and tea. I get 10*s.* a week.

10. *Thomas Butler*.—I am 12 next Sunday. I have worked here four or five months. I am a riveter's boy. I come at 6. I go away at half-past 8. On Thursday I worked over up to 10 o'clock. I have only once worked over to 10. I get 6*s.* a week. Before I came here I was in the boat yard. I was only a few months there. Before that I went to school. I was three or four years at school. I went regularly to school. I can read the second class book. I have no books at home. (Can read.) I never worked without going home to breakfast, dinner, and tea. I got 3*d.* extra for working to 10.

Messrs. Maudsley & Field, Engineers, Westminster Road, Lambeth.

11. *William Miller*, riveter's boy.—I am between 15 and 16. I carry rivets. I have worked here a year all but two months. Before I came I worked at Price's candle works. I was two years there. Before that I was at school. I come at 6 in the morning. I leave at 8 o'clock at night. I have worked to 8 every night since I have been here. At Price's I came at 6 and left at 6 at night. I can read and write; I have learned up to long division in arithmetic. I read when I go home. I read third class books and story books. I read the News of the World sometimes. I used to go to school at 7 o'clock at Price's. We were in school from 7 to quarter past 8; the school belonged to the works. There were 200 boys there; they were all obliged to go to school. I got 5*s.* a week. I get 8*s.* a week now. I have half an hour for breakfast, an hour for dinner, and half an hour for tea. I always go away for meals.

12. *William Collingwood*.—I am 14. I have been here since Christmas. I carry rivets. I used to

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carry rivets on a railway for eight months. Before that I worked at a wood turner's. I treddled the lathe. I was four years there. I got 2*s*. 6*d*. a week when I began, and 3*s*. when I left. There was only one other boy there. I used to begin at 8 in the morning and work to 9 at night. I did this all the time. I several times worked to 12. On Saturday I worked only to 4. I now begin at 6 and leave off at 8. I have tea at half-past 5 always. I go to evening school when I can. I never went to school before I came to work. I have been to evening school for a week. I go at 8 and leave at half-past 9. I go to Sunday school. I can't read. I am learning the spelling book. I get 8*s*. a week. I have four brothers and two sisters.

13. *James Brown*.—I shall be 17 next birthday. I have worked here eight months. I carry rivets. Before I came I carried rivets for two years. Before that I was errand boy. I was at school nearly nine years. I can read and write. I have learnt up to the rule of three in arithmetic. I come at 6 in the morning and leave at 8 at night. I always leave for meals. I was errand boy at a baker's in Chancery Lane. I began at 6. I slept in the house. I generally had done work at half-past 5. I used to go out with the bread. I got 2*s*. 6*d*. a week and my food. I very seldom worked after half-past 5.

14. *Thomas Herbert*.—I am 15. I carry rivets. I have been one month here. Before I came I worked 15 months at a saw-mill. Before this I worked at a coal shed for two weeks. Before that I went to school. I was six years at school. I can read a little. I read the sixpenny books now. I never read anything else. I never read the Bible. I never read newspapers. I go to night school sometimes when I get home soon enough. I always leave at 4 on Saturdays. (Cannot read.)

MESSRS. LANGLEY'S, SHIP-BUILDING YARD, DEPTFORD GREEN, DEPTFORD.

15. *Patrick Manning*.—I was 11 on the 16th of last April. I blow for the riveters. I have worked here seven months. Before I came I frightened birds in a market-garden. I was three months there. Before this I went to school. I can read. I never read now. I have read Reynolds's Journal since I left school. I go to High Street church sometimes. I can write. I learnt long division when I was at school. I get 6*s*. a week; the master pays me. I come at 20 minutes past 6. I go away at half-past 5 and half-past 7. On Saturdays I generally leave at 4 o'clock. I sometimes stop to half-past 7 on Saturdays. I always go away for breakfast and dinner. When I work to half-past 7, I have half an hour for tea.

16. *William Hartican*.—I am 16. I shall be 16 on the 24th of this month. I have worked here 16 months. On Monday I leave at half-past 5. On other nights I work to half-past 7, except on Saturday, when I leave at 4. Before I came here I worked at a smith's. I was four months there. I always left at half-past 5 there. Before that I was at school. I was nine years at school. I can read and write. There are 100*s*. in 5*l*. I was doing long division when I left school. I carry rivets. I get 7*s*. a week. I have read papers and books. I have been reading Robinson Crusoe.

17. *Charles Smith*.—I was 13 last Wednesday. I have been here seven months. Before I came I worked in a boat yard. I was three months there. I generally left at half-past 5. I go away at half-past 5 now, sometimes at 6. I get 6*s*. a week. I carry rivets. I can't read. I was at school three months. I have one sister and three brothers. My sister can read. Father is a holder-up for riveters. I never go to school.

18. *Charles Bates*.—I carry rivets. I am 16 next April. I have worked here 18 months. Before I came here I went to school. I was three years at school. (Can read a little.) I have never read anything since I left school. I can write a little. I never wrote a letter. I come at 20 minutes past 6. I go away at half-past 5. I leave at half-past 8 for breakfast. I never worked without going away for breakfast, except once. I go to night school in Guildford Street. I go four times a week. There are 26 boys there, six of them come from this yard. We go at half-past 6, and leave at half-past 8. I pay nothing. I am learning reading and writing there now. I get 13*s*. a week. I am working on a mast.

19. *Samuel Pitham*.—I was 14 last Easter. I have been here three years. Before that I was a year at school. (Knows his letters only.) I go away at half-past 5 in the afternoon. I sometimes go to the night school. I have gone three days in the week. I am learning sums. They call them stractions. I worked at a boat yard before I came here. I was a year there. When I was there I left at 6 o'clock. I get 12*s*. a week. I got 6*s*. when I first came. Father is a stoker. I have two brothers and one sister.

MESSRS. J. HEPWORTH'S IRON SHIP-BUILDING YARD, CUBITT'S TOWN, MILLWALL.

20. *Alfred Gilbert*.—I am going on for 13. I have worked here six months. Before that I was at Dudgeon's boiler shop. I was two years and a half there. Before that I worked for about 15 months at an engineer's. I was a month or so at school. I can't read. I never go to school now. I never go to Sunday school. I am striker to a smith. I get 10*s*. a week. The master pays me. I come at 6. I go away at 5 at night. I never stop after 5. At Dudgeon's boiler shop I worked to 10 o'clock for eight weeks running. I got 7*s*. then. I got 4*d*. a day overtime. That was six months ago.

21. *Philip Serle*.—I shall be 12 the week after Christmas. I look after horses. I have been two years at school. I can read and write a little. I have read the spelling book. I have not read anything else. I begin to work at 6 o'clock and leave at 5. I was in a foundry for two months. I have got three brothers and two sisters.

22. *Richard Cakebread*.—I shall be 16 next April. I am stoker to the engine man. I have been nine months here. Before I came I worked at a candle factory. I was 18 months there. Before that I worked at a rope-yard. I was four years there. I got 2*s*. when I first began. I get 12*s*. now. I was two years at school. I learnt to read. I can read the Bible. (Cannot read, but knows his letters.) I have three brothers and one sister. Two of them can read better than me. I was nine months at a wood-chopper's before I went to the ropery. I got 1*s*. 6*d*. a week then.

MESSRS. WIGRAM'S SHIP-BUILDING YARD, BLACKWALL.

23. *Mr. Clifford Wigram*.—We are obliged occasionally to employ the boys as well as the men in the night time. There is certain work in the dock which we can only do at low water, and this has to be done sometimes in the middle of the night. The men and boys are never employed for more than four hours at this work. The boys are paid at the same rate as the men for this work. They work the following day, but we take no notice of their coming late. The work is laying blocks at the bottom of the dock. It would not be done at night more than six times in the year. We always try to avoid this night-work by keeping the docks prepared for ships.

24. *George Carpenter*, shipwright's apprentice.—I

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c.

was 15 last September. I have been apprenticed one year. I am bound for seven years by deed. Before I was apprenticed I worked as a riveter's boy. I was at that nearly a year. Before this I went to school. I was about a year at school. I can read a little. I read the Bible sometimes. I never read anything else. I go to Sunday school. I have gone regularly every Sunday for six months. I come at 6 in the summer and at daylight in the winter. I leave at 6 in the summer and at 5 in the winter. I sometimes work overtime to 8. I don't think I have worked a whole week to 8 in my life. I leave at 4 in the afternoon on one Saturday, and at 11 o'clock in the morning on the next. I always go away to breakfast at half-past 8. I have another half-hour at 11, and an hour at 1 o'clock for dinner, and another half-hour at 4 for tea.

25. *George Wilson Dobbin.*—I shall be 16 on the 19th of December. I am an apprentice shipwright. I am in my second year. I was at work about a year and a half before I came here. I was a doctor's errand boy for nine months. I was three months doing nothing. Before this I was at school. I was four years at school. I lived at South Shields then. I can read. I read Lloyd's paper and the London Journal. I read the Bible on Sunday. I never go to school now. I come at half-past 6, and go away at 5 o'clock, or a quarter past. I have worked to 8 for four nights in a week. I don't often work overtime.

26. *George Lee.*—I am 14. My birthday was on the 21st of September. I am not bound apprentice yet. I have worked here two or three months. Before I came I was at school. I was at school ever since I was 5 years old. I can read. Twice 24 are 48. I have learnt long division and multiplication. I read Lloyd's newspaper sometimes. I never read anything else. I keep up my writing. I copy out of books for practice. My father is a shipwright.

27. *Samuel Eggleton.*—I shall be 18 on the 24th of December. I have been apprenticed two years. I worked here for a year before I was apprenticed. Before that I worked at Green's. I picked up nails then. I was four years there. Before that I went to school. I was 11 when I began. I was four years at school. I can read a little. I read out of my sister's book to teach myself. It is a spelling book. I can't read the paper. I come at 6 in the morning and leave at 6 in the afternoon.

THE THAMES IRON WORKS AND SHIP-BUILDING COMPANY, BLACKWALL.

28. *Mr. Piddington,* manager of the shipwrights.—We have no apprentice shipwrights. There are about 80 boys under 21 years of age employed by the shipwrights and joiners. All our work is done by contract. We contract with a few superior mechanics, who hire their own men and boys to do the work. The men and boys are paid according to the yard rate agreed to by the firm. The boys are all employed in the same work as the men, except the riveters' boys. They are the youngest boys. The shipwrights' and joiners' boys are none of them under 13 or 14. They do not generally begin before 14. We always object to boys being employed too young. There is no written agreement entered into with the boys. Our regular hours are from 6 a.m. to half-past 5 p.m. in summer, and from 7 a.m. to half-past 4 in the winter. In the joiners' shops the hours are the same all the year round, viz., from 6 a.m. to half-past 5 p.m.

In the Forge.

29. *Thomas Thurston.*—I am 17. I work at a mill furnace. I coal and pull up the door. I have been three years and a half here. I get 7*s.* 6*d.* a week. Before I worked at the furnace I piled scrap. I was six months at that. I have only worked here about four years and a half. I went to school before that. I can't read. I did not go to school much. I work on night and day shifts. I never work after half-past 5 when am working on the day turn.

30. *Thomas Stilton.*—I am 12 years old. I have worked a year and a half. I am an errand boy at the office. I was 18 months at school before I came to work. I can read and write. I go to night school now, four days every week. I get 6*s.* a week.

31. *Daniel Hynson.*—I attend to the donkey engine. I am 13. I have worked 18 months. I went to school before I came here. I can read. I sometimes read the newspaper now. I get 6*s.* a week. I work on night and day shifts. I come at half-past 5 in the afternoon when I am on the night shift. I leave off at 6 in the morning. I get to bed at about 7. I sleep in the day as well as I do at night.

32. *Daniel Dickson.*—I am 13. I have worked two years. I work at a ball furnace. I attend to the fire. I don't pile. Women pile. I get 1*s.* 9*d.* a day. I was errand boy at a doctor's for a year before I came here. I used to go sometimes before 9 o'clock. I worked very late then. I used to get home about 1 or 2 o'clock in the morning. I had to take medicine round to people's houses. I got 6*s.* a week. I left because I was kept up so late. My father is a furnace man. I can't read.

33. *Thomas Home.*—I am 9. I pull up the door for father. I have been to school a year and a half. I can't read. I work for my father. He is a furnace man.

LETTER FOUNDRIES in LONDON.

TO HER MAJESTY'S COMMISSIONERS.

Letter Foundries in London.

Mr.F.D.Longe.

D.

GENTLEMEN,

THERE are three large letter or type foundries in London in which there are altogether about 200 boys, between the ages of 9 and 16, employed. The majority of these boys are between the ages of 10 and 13. There are two other large manufactories of the same kind in the kingdom, and a few small foundries in London.

2. The boys are employed—(1.) In "breaking off," *i.e.*, in breaking off the superfluous lead from the type as it comes from the mould. (2.) In "setting up," *i.e.*, in arranging the types in sets for warehousing, or in "paying or taking out," *i.e.*, in making up parcels of particular letters for orders.

3. The boys take no part in the manufacture or in polishing the types. Type polishing, which is effected by rubbing the types on a stone, is an injurious employment, owing to the quantity of lead dust which is inhaled by the workmen.

4. The hours of work in one of these manufactories are from 7 a.m. to 7 p.m., with two hours for meals; in others, from 8 a.m. to 7.30 p.m., and from 8.30 a.m. to 8 p.m., with an hour and a half for meals. In none of the foundries are the boys in the habit of working overtime. One employer says, "We did have "overtime, but we have found that we can do without it." (Evid. 1.) On Saturday work ceases at 2 o'clock in summer, and at 5 o'clock in winter.

Letter Foundries in London.

Mr.F.D.Longe.

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5. The shops in which the boys are employed are, generally speaking, large and well built for ventilation.

6. The boys' wages vary from 2*s.* to 6*s.* per week. They are sometimes paid according to the quantity of work done, sometimes they are paid day wages. In each case they are hired by the employers.

7. I examined and questioned several boys as to their education. I found five boys who were unable to read, but most of the boys had been to school previous to their coming to work, and some of the younger boys could read well.

8. There are a considerable number of young boys, between the ages of 10 and 13, employed in machine-ruling shops. I visited one of these shops. (See Evid. 19–21.) I was informed that there were about 12 similar shops in London, and that the number of boys employed in each would average about 20. The boys' work consists merely in moving sheets of paper and laying them in heaps.

I have, &c.

FRANCIS D. LONGE.

EVIDENCE.

Evidence.

Mr.F.D.Longe.

d.

MESSRS. FIGGINS & CO., TYPE FOUNDERS, WEST STREET, SMITHFIELD.

1. *Mr. Figgins, junior.*—There are only three type foundries of any size in London. Besides these there is one in Sheffield, and one in Scotland. We have about 80 boys under 18 in our works. They begin at about 11 years of age. There are three parts of our work in which the boys are employed, in "breaking off," "setting up," and "paging or taking out." The boys generally begin with breaking off, and then go on to the other work. Those who stop do the regular men's work. Our usual hours of work are from 7 in the morning to 7 at night, with two hours for meals. On Saturday we close at 2 o'clock. We work two nights a week to 8 to make up for the two hours lost on Saturday. We very rarely indeed, have any overtime beyond these two hours. We did once work overtime ; but we have found that we can do without it. We don't work overtime now once in a year. We hire and pay all the boys ourselves. Some work piece-work and some work day-work.

2. *George Jennings.*—I am getting on for 13. I break off. I have been here about eight months. I come at 7, and leave at 7 at night. I work to 8 on Wednesdays and Thursdays. On Saturdays I leave at 2 o'clock. I get my breakfast at half past 8. I have till 9 for breakfast. I have from 1 to 2 for dinner, and from 5 to half past 5 for tea. I have my meals here. I sometimes go home to dinner. I work piece-work. I get ½*d.* for 1,000 types, or 1*d.* for 8 lbs. of another kind. I only have to break off the ends. I generally make 4*s.* 6*d.* or 5*s.* a week. Before I came, I worked at a fancy box-makers. There were eight boys there besides myself. I used to make little wooden boxes. I worked there from 8 to 8. I was 9 years old when I first went there. The other boys were older than me. I was two years at school. I can read very little. I go to Sunday school. I read there. I don't read anywhere else. (Could read).

3. *William Dillworth.*—I am getting on for 12. I set up types. I have worked here nearly two years. When I first came I broke off. I have only worked twice after 8, since I have been here. Before I came, was errand boy at a flower-makers. I was there about one year and six months. I used to come at 9 and leave at 9. Sometimes I got home at 8. I never worked after 9. I was not working all the time. I was at school for nine months. I can't read. I sometimes go to night school. I leave at 2 o'clock on Saturday.

4. *John Laban.*—I am 12 next birthday. I have been here a year and three months. I break off. Before I came I went to school. I was five or six years at school. (Cannot read.) I never go to school now. I have no father. I have one brother and two sisters. We live with one another. Father was dead before I went to work.

5. *Edward Dace.*—I shall be 12 on the 16th of March. I have been about six months at work here. I break off. Before I came here I made pen-holders at Mordan's in City Road. I was there about 9 or 10 weeks. Before that I was at an ink manufactory. I was the only boy there. I was there about six months. Before that I was at school. I was at school ever since I was 2 years old. Father works here. I have six brothers and one sister. One brother lost his arm in a printing machine. I make 5*s.* or 6*s.* in the week.

MESSRS. CASLON & CO., LETTER FOUNDERS, CHISWELL STREET, FINSBURY.

6. *William Sturges.*—I was 11 on the 23rd of last November. I have been here since Easter. I set up. When I first came I broke off. I get what I earn. I generally get 5*s.* a week. I come at 8. I go away at half-past 7. I very seldom stay after half-past 7. On Saturdays I come at 5. I go away to dinner at 1 o'clock. I come back at 2. I stop at 5, for tea, to half-past. Some go away for dinner. I worked at an umbrella makers before I came. There were only two boys there. I ran on errands there. I was six months there. Before that I was at school. I was three years at school. I can read out of the Bible a little. I read at school. I have read Bow Bells at home.

7. *John Ewer.*—I shall be 12 on the 18th of next February. I set up, and page up. I have been here two years. When I first came I broke off. I get about 5*s.* I get what I earn. The master pays me. I come at 8. I go away at half-past 7. I never stayed later than that. On Saturday I leave at 5. I get my dinner here. I get it in this shop. Before I came I went to school. I was seven years at school. I can read. I have read the Bible and other books as well. I read Sunday at Home and Leisure Hour.

8. *William Perrin.*—I shall be 13 next October. I have been here a year and a half. Before I came I was errand boy at a doctor's. I went at 8 in the morning. I left off at half-past 6 at night. I break off. I come at 8. I go at half-past 7. I never stopped after that. On Saturday I leave at 5 o'clock. About two or three months in the summer, I left off at 2 o'clock on Saturdays. Before I went to the doctor's I went to school. I was at school ever since I was 3 years and a half old. I can read the Bible. I have read Cassell's Illustrated Paper.

9. *Stephen Purchase.*—I am 14 on the 18th of March. I have been here about one year and five months. I was away for three months out of it. Before came here I worked at another type foundry. There were only four boys there. I was a year there. Before that I went to school. Both my father and mother died before I went to work. I used to work from 8 to 8. I sometimes worked to 9 or 10 at night. I worked about six times to 10, and four other nights I

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Mr. F. D. Longe.

d.

worked to 9. I never worked here to those hours. I get my breakfast before I come. I sometimes go home to dinner. Every day but Saturday I go home to dinner. In the winter we leave at 5 on Saturdays. In the summer we leave at 2 on Saturdays. I can't read. I have two brothers and one sister older than me.

10. *Benjamin Fernando Jones.*—I was 12 last October. I go errands and set up. I have been here four years this month. I set up when I first came. Before I came here I went to school. I made about 4*s.* or 5*s.* a week when I set up. I can read. I used to read the Bible at school. I read lesson books. I have read the Standard and sometimes the Telegraph newspapers. Father brings the paper home. I come at 8. I go away at half-past 7. I get my dinner here. I stop an hour for dinner. On Saturdays I go home at 5. In summer time I leave at 2 o'clock on Saturdays. I have no regular dinner time. In the summer I leave at 7 on Mondays and Fridays. At Christmas, Whitsuntide and Easter, we have a day or a day and a half holiday.

MESSRS. B. BESLEY & CO., LETTER FOUNDERS, FANN STREET, FINSBURY.

11. *Thomas Jones.*—I am getting near 10. I shall be 10 next March. I have worked here about two months. I set-up. I began with setting-up. I am paid by the quantity I do. I generally get 2*s.* a week. I never get more. I come at 8½, I go away at 8. On Mondays I leave at 7. On Saturdays I leave at 6. I have never worked later than that. I go home for dinner at 1 o'clock. I come back at 2 o'clock. Before I came here I went to school. I was five years and a half at school. I can read newspapers. I used to read the Bible. I read Bow Bells when I go home sometimes to my mother and sisters. I have a father and mother. Father is a carman.

12. *Francis Frazier.*—I was 11 last week. I set up. I have been here 11 months. I come at 8½, and I leave at 8 in the evening. On Mondays I go at 7, on Saturdays I go at 6. I always go home for my dinner at 1 o'clock. Most of the boys go home for dinner. I generally get 2*s.* 6*d.* or 3*s.* a week. The master pays me. Before I came here I went to school. Was four years and a half at school. I can read a little. I read at Sunday school. I go every Sunday to school. I have three brothers and no sisters. Two of them are younger than me.

13. *Henry Holman.*—I am going on for 12. My birthday is some day this month. I have worked here two or three years. I break-off. When I first came I broke-off. I work piece-work. I generally get 5*s.* 6*d.* When I first came I worked here three days, and went to school three days. I work under my father. Another boy did the other three days when I was away. I have two brothers and one sister. Sister does not work. My brothers don't work. Before I began to work I went to school. I was two years at school. I can read spelling books and the Testament a little. I never read anything at home. I don't go away for dinner. I eat it in this room. I never worked after 8, except once.

14. *George Aldridge.*—I am getting on for 12. I have been here for a couple of months, I break-off. I generally get 2*s.* or 3*s.* a week. I go away for dinner. Before I came I worked at Caslon's. I set up. I was two months there. Before that I went to school for about four months. The school I went to was in Golden Lane. I learnt to read the spelling book. I never read anything at home. I have two brothers and two sisters. My brother works at Hendon's pen-making shop.

15. *Francis C. Robertson.*—I am 10. I have been three months here. My birthday is in this month. I break-off. I come at half past 8. I go away at 8. On Saturday I go at 6 o'clock. I get my dinner at home. I live close by. My father is dead. I have eight brothers and sisters. Two are younger than me. Before I began work I went to school. I can't read much. I was reading a book about two dogs when I left. I can spell a little. I generally earn 5*s.* in a week, sometimes only 4*s.*

MR. T. PLUMMER, STEREOTYPER AND PRINTER, 2, GOLDSMITHS' COURT, HOLBORN.

16. *Mr. T. Plummer.*—I employ about five boys between 14 and 18 in the stereotyping department, and about four boys of the same age in the printing department. In neither department are boys under that age of any use. I have never employed any boy under 13, except as an errand boy. Some of my boys are apprenticed by deed. The hours of work during which the boys are employed on steam printing machines are generally much longer than in places where they only use hand machines. It is necessary to keep the steam machines going to make it pay. They are often kept going from Thursday to Saturday.

17. *Charles Wells Curtis*, apprentice stereotyper.—I am turned 18. I have been apprenticed here 18 months. Before I came I was an apprenticed printer at Phillip & Barber's. I began there at about 16. I was at school before I went there. I was at school several years. I begin at 8 o'clock regularly, and leave off at 8 o'clock at night. It is 18 months since I have worked overtime. I never worked overtime at Phillip's & Barber's. My hours there were from 8 to 8.

18. *Charles Vardy.*—I am 20 years old. I have worked here three years. I am an apprentice printer. Before I came here I was at Mackintosh's, a machine printer's. My hours are from 8 to 8. When we work over I work to 10. I very seldom work over. I never worked for a week together to 10. On Saturday I leave at 5. We always have an hour to dinner. We can leave or not as we like. I always have an hour, and sometimes more. We have half an hour for tea. I was at school until I went to Mackintosh's.

MR. F. G. CROWE'S, MACHINE RULER, SOUTHAMPTON COURT, HOLBORN.

19. *George Whiting.*—I am 10 years old. I put paper into the machine. I have worked here seven months. I come at 8 o'clock, and leave at 8 o'clock at night. I never worked after 8. I go away at 1 o'clock for dinner. I come back at 2. I never worked on without going to dinner. I get my tea while we are not working. Before I came here I was in the first class at school. I used to do sums. I did addition and multiplication. I used to read the Bible at school. I read my little book at home now. I forget what it is about. I don't read very often. I read it to my mother. I get 3*s.* a week. I have day wages.

20. *William Wood.*—I am 11. I don't know when my birthday is. I take out. I have been here about six months. I come at 8. I go away at 8. On Saturdays I go at 7. I never worked after 8. I go away at 1 o'clock for dinner. I have an hour always. I get 2*s.* 6*d.* a week. I used to go out for water. I was at school before that for a month. I used to play about the streets. I go to night school from 8 to 9. I go on Mondays and Fridays. I pay nothing. Father is a cabman. I have two brothers and one sister.

21. *George Elliott.*—I am 10 years old. I have been here for nearly a year. I take out. I get 3*s.* a week. Before I came I went to school. I can't read. I come at 8. I go away at 8. On Saturdays I go at 6. I never worked after 8. I go away at 1 for dinner. I come back at 2. Father is dead. I have two brothers. I never go to school. I never go on Sundays.

Letter Foundries in London.

Mr. F. D. Longe.

d.

MR. S. MORDAN'S PENCIL MANUFACTORY, CITY ROAD, FINSBURY.

22. *Mr. S. Mordan.*—Out of about 300 hands we have about 45 boys between 12 and 20. Most of these boys are apprenticed by deed to different trades. Some are apprentice lock makers, others are apprentice pencil makers. Our lads are generally our workmen's sons. They are never apprenticed before 14. They are apprenticed to the firm. The hours of work are from 6 to 6 in summer, and from 8 to 8 in the winter, with two hours out of that time for meals. I do not think the boys ever work overtime. We very seldom have any overtime. On Saturdays we leave off at 2 o'clock. There is no addition to the time of work on the other days of the week to make up for Saturday. The hands don't work 60 hours a week regularly.

23. *John Jelks*, apprentice, silversmith.—I am 18 next birthday. I have been apprenticed three years. I come at half past 8. I go away at 8 at night. I never work after 8. On Saturday I leave at 2 o'clock. I go away for dinner on all days, except Saturdays. Before I came here I was at school, till I was 14. I am not a very good scholar. I can write and read.

24. *John Neil.*—I am in my 20th year. I have been an apprentice four years. Before I came I was at a perfumer's. I was two years and a half there. I made violet powder. There were three other boys there. Before that I was at a printer's. I was at a machine ruler's when I was about 12 or 13 years old. There were 60 other boys with me. Our hours there were from 8 to 8. Every week we worked some hours overtime. We worked to 9 or 10 two or three days out of each week. Before that I was at a lithograph printer's. I was about three months there. Before that I was at a glass cutter's. I ground glass in the shop. I was only a month or two there. Before that I was at an eating-house keeper's. I washed up plates. I was about 11 when I went there. I was three months there. I worked from half-past 7 to 8. I always left at 8. I was at school for four years before that. I could not read when I went to work. I am a Sunday school teacher now.

25. *William Ward.*—I am 16 on the 24th of next January. I have been apprenticed since last May as a silversmith. I have been here three years. I come at half-past 8. I go away at 8. I never work after 8. I am paid day wages. On Saturday I leave at 2 o'clock. Before I came I worked at a watchmaker's. I worked from 7 to 7. I was two years there. I used to work to 7 on Saturdays there as on the other days. Before this I worked at another watchmaker's. I was hardly 10 years when I went there. I worked then from half-past 7 to 8. I worked the same time on Saturday. We never worked after 8. I was nine months there. Before that I was at school since I was 4 years old. I could read and write and knew arithmetic when I left.

The COPPER WORKS in SOUTH WALES.

TO HER MAJESTY'S COMMISSIONERS.

Copper Works in South Wales.

Mr. F. D. Longe.

E.

GENTLEMEN,

In the town of Swansea and at Port Talbot in Glamorganshire there are six large works in which copper is rolled into sheets and rods. These rolling mills are very similar to those in the iron trade. A large portion of the hands employed are youths and boys of 12 years of age and upwards. In the same district there are copper smelting works, some of which are connected with the rolling mills. In these works few young hands are employed. Copper smelting is a more unhealthy employment than that of the blast furnaces of the iron trade, owing to the presence of so much arsenic, sulphur, and other noxious elements in the ore. It is necessary to free the metal from these impurities before it is ready for rolling. This is effected in the copper works by the successive processes of calcining, roasting, and refining. In all these employments the hands employed are adults (Evid. 21).

Age at which boys are taken into these works.

2. The boys employed in the rolling mills generally begin at about the age of 12. In one case I was informed that the firm objected to the employment of any boys under the age of 14, but this rule was not strictly carried out (Evid. 16).

Employment of boys and youths.

3. The younger hands are employed (1) in picking up or bundling scraps from the shears, (2) in moving plates and drying them after being pickled, and (3) in assisting at the rolls. These employments are very similar to those of the same class of hands in the iron works. There is no work in which very young boys are exclusively employed, such as the door drawers and staff carriers in the iron works.

Hours of work.

4. The work in these mills is, for the most part, carried on by day and night shifts, as in the iron trade, the hands changing between 5 and 6 o'clock in the morning and evening. In one or two cases, however, I found one set only employed, their hours of work being from 6 a.m. to 8 p.m. (Evid. 22). One boy of twelve had worked for four days together from 6 a.m. to 9 p.m. (Evid. 11). Another boy of 14 years of age had worked to 12 o'clock every other day in the week previous to my visit, and was working the same hours that week (Evid. 18). The hours of work in the warehouses are very irregular. Two sets are not employed; one boy of 16 years of age had often worked through the night, sometimes two nights in the week (Evid. 17).

Meal times.

5. The meal times are observed more regularly than in the iron works. The "heats" are more easily regulated. The rolls are stopped for breakfast, and for dinner during the day, and for half an hour at 10 o'clock during the night.

State of education.

6. The boys employed in these works had generally been at work before they came to the trade. Many had been some years in the tin works, others had been assistants to riveters, masons, &c. I examined or questioned 29 boys of ages varying from 12 to 15, and found that 14 could either read or professed themselves able to do so, and that 15 could not. A few said they could read Welsh a little, though they had not learnt to read English.

7. The boys are hired by the employers. Their wages range from 6*s.* a week upwards.

I have, &c.

FRANCIS D. LONGE.

EVIDENCE.

Messrs. Williams, Foster, & Co., Morfa Copper Works, Swansea.

Copper Works in South Wales.

Mr.F.D. Longe.

e.

Rolling Mills.

1. *John Isaacson*, rollers' assistant.—I am going 14. I have worked here about a year. I raise copper at the rolls. I work on night shifts and day shifts. I never was hurt. I never staid away from work for illness. I was a year and a half at school before I came to work. I can't read English. I can read Welsh a bit. I learn at Sunday school. I get my dinner at half-past 12. I always stop an hour for dinner. I always stop for half an hour at 9 for breakfast. I get my tea when I go home. On the night shift I come at half-past 4. I leave at 6 o'clock in the morning. I get my supper in the middle of the night. I don't stop during the night at any regular time for my supper.

2. *John Colbrook.*—I am 14. I have worked here about 5 months. I dry plates with the picklers. Before I came here I worked in other copper works I was there 18 months. Before that I carried rivets I was six months at that. Before that I was at school till I was 10. I work on both shifts. On Saturday I leave at 5. Sometimes I leave at 1 o'clock on Saturday. I get 6*s*. 4*d*. a week. I have weekly wages. I can read and write.

3. *William Lewis.*—I am just past my 14th. I have worked here three years. When I first came I carried scraps. Now I am at the rolls. I get 6*s*. 6*d*. a week. I got 5*s*. when I first came. Before I came here I opened plates at another place. I was a year there. Before that I was at school. I was two years at school. I can't read. I work on both shifts. I stop at 1 o'clock for dinner. I always have an hour. I always stop for breakfast at 9. I have half an hour.

4. *Peter Davis.*—I am 14. I have worked here six months. I bundle scrap. I work on both shifts. I come at half-past 4 at night and leave at 6 in the morning when I am on the night shift. We begin to work about 5. I get 6*s*. a week. I worked in some oil works a year before I came here. Before that I worked in some copper works. I was for two years attending masons. Before that I worked in a brick-yard. I was only two months at that. Before that I was at school. I was three years at school. I can't read.

5. *John Davis.*—I am going 13. I have worked here 7 months. I carry scrap. Before I came here I was at school. I can't read. I get 5*s*. a week.

6. *James Rees.*—I am 14. I raise at the rolls. I have worked here three years. Before that I went to school. I can read. 6 times 7 are 42. (Spells *railroad*, &c.)

7. *George Brown.*—I am 14. My birthday was in last August. I have worked here 4 years. When I first came I carried scrap. I pull out from the roll. I am paid by the piece. The roller pays me. I worked with the masons before I came here. I was one year with them. Before that I was at school about a year. I can't read. I always get my breakfast here. I get it as I can. I generally stop about half an hour. The engine stops at 1 o'clock for dinner, and goes on at two o'clock. All the rolls stop working then. I never saw anybody burnt badly. I never went to the doctor for anything.

8. *David Davis.*—I am 10. My birthday is next Thursday. I shall be 11 next Thursday. I raise sometimes, and sometimes I carry scraps. I have worked here four months. Before I came I was at school. I can't read very well. Father is a bargeman. I have three sisters and four brothers. I go away at 5 o'clock when I work in the day. When I work at night I leave at 6.

9. *William Williams.*—I am going on my 13th. I raise plates at the rolls. I have worked here more than a year. Before that I washed the copper. Before I came here I was at Jenkins' tin works. I branned. I was there half a year. Before that I opened plates at a tin works. I was two years there. Before that I went to school. I can't read English. I can read Welsh a bit.

Messrs. Vivian & Co.'s, Hafod Copper Works, Swansea.

10. *Isaac Lloyd.*—I am going on for 14. I have worked here about 3 years. When I first came I picked up scrap from the shears; now I dry sheets after pickling. I am working on the night turn; I have just begun. I come at 5 o'clock; I shall go home about 1 o'clock; I think I shall have finished my work about that time. I am working by the piece. I have a certain quantity of sheets to dry to-night before I go away. I was in the Landore tin works before I came here. I branned tin there. I was one year there. Before that I did nothing. I cannot read. My father is dead; he has been dead six years. He was dead before I went to work. I have one brother and four sisters at home. I get 7*s*. a week. Last Saturday I began at 5 in the morning and finished about 4 in the afternoon. I did my two turns in that time. I work harder when I have to do two turns. I only stop half an hour during the time. I can always do two turns by 5 o'clock on Saturday.

11. *Edward Russell.*—I am going 13. I have worked here a year and a half. I wash. When I first came I handed sheets to the shearer. I am on the night turn to-night. I shall give over about 1 o'clock. When I worked at the shears, I used to work to 9 o'clock for four days running. There are not two shifts at the shears. I have to stay away sometimes when I am bad. I have a sore throat now. I went to the doctor; he gave me something to drink. I have no father. Father has been dead seven years. I have four sisters and three brothers. There is only one younger than me. I was half a year at school. I can read a bit. I get 6*s*. a week.

12. *James Martin.*—I am 14. I am errand boy to the storekeeper. I have worked here two years. I was in a warehouse one year. Before that I was at school. I can read and write. (Spells well.)

13. *Thomas Davis.*—I am 14. I have worked going on for two years. I carry copper to the picklers. I work on the night and day turn. Last Saturday I began at about 6 o'clock in the morning; I left off at a quarter to 5. I never stop later than that on Saturdays. I did two turns last Saturday. I shall stop at 1 o'clock to-night. When I am on the night turn I have generally done my work at 1 o'clock or a quarter past. I shall stop about half an hour for supper at 9. Before I came I was in some tin works. I branned. I was three years there. Before that I was at school. I was but two years at school. I can read a little bit of English. I can read Welsh. I learn at Sunday school. I read the Welsh Bible at home sometimes.

14. *Thomas Rees.*—I am 16. I have worked 5 or 6 months. I worked at some tin works before that. I greased. I was four months there. Before this I did nothing. I went to school a bit. I was about three months at school. I was at home the best of the time. I have five brothers and sisters.

15. *Philip Stevens.*—I am 13. I have worked here about 12 months. Before I came here I drove barges on the canal. I never went to school. I drive up. I get 6*s*. a week. I began at 5 o'clock this evening. I expect to get home about 2 o'clock.

Copper Works in South Wales.

Mr. F. D. Longe, e.

MESSRS. GRENFELL AND CO.'S, MIDDLE BANK COPPER MILLS, SWANSEA.

16. *Mr. George Nancarrow*, manager of the works.—We have for many years attempted to carry out a rule that no boys should enter the works under 14 years of age, and that they should be able to read and write when they come. It is the desire of the firm that this rule should be strictly adhered to, but in practice we have not been able to carry it out thoroughly. There are no boys, however, in our works under 12, if there are any under 13. There are three day schools supported by the firm. The majority of the boys at these works have been educated at these schools. The younger boys are generally employed at pickling and moving plates. Most of them are only employed during the day. We generally work the rolls by double shifts. When we only work in the day, our hours are from 6 to 6. We never work to 8. If we wanted to work longer we should put in another shift. In the smelting works there are a few little boys employed in wheeling coals. Our rolls are always stopped at breakfast time for half an hour, and from 1 to 2 for dinner. On Saturday, the hands on the day turn work another turn in the evening, beginning at about 4 and working to about 9 or 10. They are never in the works after 12 on Saturday night. There are no small rolls used in the mills about here.

WAREHOUSE.

17. *William Davis.*—I was 16 last January. I work at the warehouse. I have worked here four years, or nearly five years. When I came first I worked at pickling. I get 3*s.* a week. I was at school before that. I went to the day school. I can read and write. (Spells well.) I come at 6. As a rule I leave at 6. There are never two shifts in the warehouse. I sometimes work overtime. I never worked a whole week to 8. I have worked two nights in the week through the whole night. I have worked through the night more than 40 times since I have been here. There are three other boys in the warehouse. I am the youngest. When I was pickling my hours were from 6 to 6. There were always double shifts at that work.

IN THE ROLLING MILL.

18. *James Hughes.*—I am 14. I hold up at the bolt mill. When I first came I cleaned sheets. I get 7*s.* a week. I got 5*s.* when I first came. Before I came here I worked at Williams and Foster's. I swept up. I was six months there. Before that I was a school. I can read a little. (Cannot spell *railroad*—does not know how much 6 times 7 are.) I go to night-school now. I go four times a week. I pay 3*d.* a week. I am going to work to 12 to night. I am working two turns to-day. There were two other boys working with me. There is no night shift at the bolt roll. I worked last night and Tuesday night to 12. Last week I worked to 12 every other day. They never have two shifts at the bolt mill. There are four men and three boys at the bolt roll.

19. *Robert John Price.*—I am going on my 16th. I have worked here four years. Before I came I was at school. I went to Mr. Grenfell's school. I work behind the metal roll. I work on day and night shift alternate weeks. I get 4*s.* a week. I always stop for dinner. The roll always stops from 1 to 2. It also stops at breakfast time from 9 to half-past 9. In the night time it stops at 10 to half-past 10. It does not stop again in the night. We stop about a quarter of an hour after each heat. I can read a little. I can read the third book. I read the Bible at Sunday school. I never read anything else. I never read a newspaper.

20. *Rees Davis.*—I am 15. I worked three years at the Middle Bank works before I came here. I carried materials for the master. I pickle now. I come at half-past 6 and I leave at 20 minutes to 6 at night. When I am on the night shift I begin at 6 o'clock, and I finish about half-past 4 or 5 o'clock in the morning. I never stop after 6. I was five years at school before I came. I can read. I go to Sunday school now. I never go to night school. (Cannot spell *railroad;* does not know how much 6 times 7 are.) I forget all that now.

MR. C. LAMBERT'S, COPPER WORKS, PORT TENNANT, SWANSEA.

21. *Mr. David Owen*, manager of the smelting works.—There are no boys employed in the smelting department, or in working or refining the copper. There are a few boys employed by the masons who repair the furnaces. The most unwholesome part of the work is the calcining process. The Cornwall copper ore is the worst. It has more arsenic and sulphur in it. These impurities are all burnt out of the copper before it is ready for rolling ; *i.e.* before it goes into the mill furnaces where the boys are.

22. *Mr. Morgan Thomas*, manager of the mill.—The youngest boys in the works are employed in pickling and sorting sheets. There are no boys employed in putting up furnace doors, as in iron works ; the furnace men do this work themselves. We always stop all the rolls at dinner time. Our heats are more easily managed than in the iron works. In times of good trade we work two shifts ; but when trade is dull we sometimes work with one set only, and their hours are from 6 in the morning to 8 at night. I have never known of any case where a man has had to leave the work because it did not agree with him. All the sulphur and arsenic is drawn off before the metal comes into the mills.

ROLLING MILL.

23. *John Audry.*—I was 16 last week. I have worked four years and a half. I work a furnace now. When I first came I worked with the picklers. I was a year and a half at that. Then I raised plates at the rolls. I get 15*s.* a week now. I begin at half-past 6 in the morning and leave off at 5 at night when I am on the day turn. I have a regular time for meals. I have from half-past 8 to 9 for breakfast, and from 1 to 2 for dinner. The machinery always stops for dinner.

24. *David Hopkins.*—I am going 11. My birthday is in next March. I have worked here one month. I carry sheets for the picklers. I was six years at school before I came. I can't read. I stop for dinner at 1. I have an hour.

25. *Edward Evans.*—I am 14. I have worked here four months. Before I came here I worked with the boiler makers. I carried rivets. I was five months there. Before that I did nothing. I can't read.

26. *David Lewis.*—I am going on for 16. I have worked here three months. Before that I worked on a coal bank. I was two years there. Before that I carried rivets for boiler makers. I was three months there. Before that I worked with the masons. I was only a fortnight with them. I was six years at school. I can read. I pickle now. I work on night turn as well as day turn. I always stop from 1 to 2 for dinner when I am on the day turn.

N.B. I questioned seven boys and found that five could read and two could not.

Hand-loom Carpet Trade in Dewsbury, &c.

Mr. F. D. Longe.

F.

The HAND-LOOM CARPET TRADE in the Neighbourhood of DEWSBURY, in the WEST RIDING of YORKSHIRE.

To Her Majesty's Commissioners.

Gentlemen,

General state of the trade.

1. In the town of Dewsbury and the neighbouring parishes, the manufacture of carpets by hand-looms is still carried on to a considerable extent, and it appears that notwithstanding the increase of the power-loom carpet trade, the hand-loom trade is improving. During the last 14 years this trade has undergone great depression. In 1851, there were 3,400 hand-loom carpet weavers in England and Scotland; at that time a good workman in the Dewsbury district could earn from 24*s.* to 30*s.* per week throughout the year. In 1852, their earnings fell to about half this rate. Since 1856, the trade has been improving. There are now about 2,300 weavers in the trade, and the price which the carpets fetch affords about 1*l.* a week wages to the weaver. (Evid. 5.)

Employment of "winders."

2. The weavers employ children or women to wind the worsted on their bobbins. When children are employed there are about two children to every three looms, according to some of my informants; but, upon visiting different shops I found very great differences in the number of winders employed.

Ages of the winders.

3. Children are employed at a very early age at this work. They are for the most part boys between 8 and 13 years of age. In many cases they are the sons or brothers of the weavers. It is not uncommon for boys under 8 years of age to be employed. (Evid. 3.) The work can be done either by children or women. In one shop I visited, I found women winding for six looms, and earning 7*s.* or 8*s.* a week. (Evid. 11.)

Hours of work.

4. The ordinary hours of work for a hand-loom weaver in this district are from 6 a.m. to 7 p.m., in some shops to 8 p.m. The work is very laborious, and these hours could not be exceeded. (Evid. 1, 2.) There seems to be no regularity as to the hours of work for the winders. They do not generally come so early as the weavers, and are able to finish their work so as to leave the shop two hours sooner. (Evid. 4, 7.)

Meal times.

5. There are no regular times of stopping work for meals. (Evid. 8.) The winders have about half an hour for dinner. Their meals are taken in the shops in many cases.

Nature of employment.

6. The operation of winding the worsted yarn is extremely simple and easily learned. One employer says that "a boy can learn it in a day" (1). Care is requisite to prevent the yarn being twisted or broken. When the children are too young, or careless, the weavers are kept back in their own work. (Evid. 9, 10.) It would naturally require practice to enable a child to wind fast enough to earn much. (Evid. 11.)

Place of work.

7. The atmosphere of many of these shops was most unwholesome from the want of ventilation and cleaning. The process of weaving fills the air with a minute dust. In most of these shops the space from floor to ceiling is filled up with the looms.

Hiring and wages.

8. The winders are all hired and paid by the weavers. In some of the small shops the earnings of the children are very small. A boy of 9 years old, who was winding for two looms, only made 2*s.* or 3*s.* in a fortnight. (Evid. 3.) In another shop, however, two brothers, one of 9 and the other 12 years old, who were working as half-timers, earned 2*s.* 6*d.* a week between them. (Evid. 12.) The weavers are not always engaged on the same kind of carpets. In some works they are able to afford a higher wage to their winders than in others. One informant expressed his opinion that the average earnings of weavers were not above 15*s.* a week, including the wages they paid to their winders. (Evid. 7.)

Some of these shops under the Factories Acts.

9. A few of these shops are so connected with mills, in which steam machinery is in work, as to come within the operation of the Factories Acts. In these shops the children are employed on the half-time system. (Evid. 7, 11.) There is no difficulty in getting half-timers when the men have regular work, and are able to pay a sufficient wage. (Evid. 11.) Some of the employers, as well as the men, are averse to having half-timers, when they can avoid it. When the hand-loom shops are near their mill, they go to some expense in blocking up doors, &c., so as to prevent their being included with the mill under the Factories Acts.

Hand-loom blanket manufactories.

10. I also visited a few hand-loom blanket shops in the same neighbourhood. Although there are supposed to be about 500 blanket hand-looms in the district, the owners have very little work for them. Blanket weaving by hand-looms is very slow and laborious work, and is gradually yielding to the power-loom manufacture. Boys of 9 or 10 years of age are sometimes employed to wind the worsted yarn, as in the carpet shops, but the work is chiefly done by women in their own homes.

Hand-loom linen weaving.

11. The manufacture of coarse kinds of linen goods still supplies some intermittent employment to hand-loom weavers in the town and neighbourhood of Barnsley. The looms are in the houses of the weavers, generally in the cellars. The winding is done by the wife or the family of the weaver. Although there are said to be about 1,000 hand-looms in Barnsley, I gathered from a few visits I paid to the weavers' houses, that their trade is in such a moribund state, like that of the hand-loom blanket weavers, that evidence as to the condition of the few children occasionally employed in it would not be called for.

I have, &c.
Francis D. Longe.

EVIDENCE.

At Mr. C. Fox's, Carpet Manufactory, Dewsbury.

Evidence.

Mr. F. D. Longe.

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Mr. T. B. Fox.—We have a mill in which we spin worsted yarn with steam machinery. This part of our premises is under the Factories Acts. We have no half-timers there. Besides the rooms under the Factories Acts, we have seven rooms in which carpets are made by hand-loom weavers. These rooms are

Hand-loom Carpet Trade in Dewsbury, &c.

Mr. F. D. Longe.

f.

not under the Act. We have about 60 looms working in these rooms. The weavers employ children to wind for them. There is generally a winder to each weaver; sometimes one winder supplies two weavers. There is one weaver to each loom, except for the four or five broad looms, on which two weavers are employed at the same time. Each weaver employs his own winder and pays him so much per piece. The winder's work is to wind the yarn from the hank on to the bobbins as the weaver empties them. It is easy work. A boy can learn it in a day. The weaver generally employs his own son. The boys stand as they work. They have to move about, to take the bobbins backwards and forwards from the weavers. At one place the weavers have to wind for themselves because the shop is under the Factory Act, and the weavers cannot get boys to do it, they cannot get boys above 13 to do it. I cannot get two to work half days at it. A boy of 13 would want about 4*s.* a week. A carpet weaver could not afford to pay that sum. Their own wages do not average more than 38*s.* or 39*s.* in a fortnight. Many men cannot finish a piece in less than three weeks. Our hours in the carpet shops are from 6 to 8. The men work piecework. The children do not come until about 8, and they go away at 5 in the evening. A law preventing children from working before 6 in the morning or after 6 at night would not hurt us. The men never work after 8.

2. *Mr. John Room*, hand-loom weaver, Dewsbury.—There are about six places now in Dewsbury where there are hand-loom carpet weavers. There are generally about two winders to every three looms. There are no boys weaving under 15 years of age, I should think. The master pays the apprentices from 4*d.* to 6*d.* per yard, and then deducts 2*d.* or 3*d.* in the shilling when the piece is done. The carpet would sell for about 2*s.* or 3*s.* per yard. As far as the winding is concerned, the weaver could do as well with two children as with one. Children earn on the average 2*s.* or 2*s.* 6*d.* per piece. They would not earn more than 2*s.* 6*d.* if they were winding for two looms. The general hours of hand-loom weavers are 6 to 7. I have worked from 6 to 8, but that is hard work, and as much as a man can do.

AT MR. J. ARMSTRONG'S, CARPET MANUFACTORY, HECKMONDWICK.

3. *Charles Heywood*, worsted winder.—I am just turned 9. I have been here one month. I was two years winding at a place before I came here. I have been to school on Sundays. I get sometimes 2*s.* 6*d.* and sometimes 3*s.* for a fill in a fortnight. I wind for two looms. I come at 8 or 9 in the morning. I never come before 7. I go away sometimes at 4 and sometimes at 6, or 7, or 8. I have never stopped to 9. I get my breakfast here. I don't stop long for breakfast. I don't play. I get my dinner here at 12½ or 1 o'clock. I generally have half an hour for dinner. My father lives a mile and a half off. I have a mother, two brothers, and two sisters. All work but one. He is about 4 years old. He goes to school. (Cannot read.) It is not hard work. I never go out of the shop during the day to play.

4. *Walter Willey.*—I am going 12. I have worked three years. I have never been to school. I come at 8, after I have had my breakfast. My father works here. I work for him. I bring his breakfast in the morning. I go home to dinner at 12 with my father. I go home to tea and bring father's tea here. I sometimes have finished my work at 6. I do not always stop so long as my father and brother. They can work about two hours after I have gone. Sometimes I go at 12 and don't come back till half-past 1. No winders have ever done before 5 o'clock. I never went to school. I can't read. I have six brothers and sisters. All work but mother.

5. *Mr. John Antey*, carpet manufacturer, Heckmondwick.—I was a carpet weaver myself some years back. Our trade has been in a very bad way for some years. In 1851 there were 3,400 carpet weavers in England and Scotland. I could then make from 24*s.* to 30*s.* per week throughout the year. In 1852 I only made 13*s.* 8d. per week throughout the year. I then gave it up. At the present time the number of weavers is about 2,300. The trade has been improving since 1856. Our trade was injured by the application of steam power in the manufacture of Brussels and Kidderminster carpets. A man can make 20*s.* a week now, if he has work.

MESSRS. BIRCH AND SONS', WORSTED SPINNERS AND CARPET WEAVERS, HECKMONDWICK.

6. *Mr. John Bates.*—We have 60 looms at work. There is one winder for two looms. We have 25 winders who work under the half-time system of the Factory Act. This system works very well with them, except that there is some difficulty in getting the children. The work does not require any learning. There are two sisters working there who get 1*s.* 9*d.* each, or 3*s.* 6*d.* in the fortnight. We get the two children for the same price as one. There is no other work for children under 13 years of age just about us.

AT MESSRS. FIRTH'S, CARPET MANUFACTORY, FLUSH MILLS, HECKMONDWICK.

7. *James Crabtree*, foreman of carpet shop.—We have had two shops under the Factory Act for the last seven years. The winders in these shops are most of them half-timers. The weavers in our shops are now earning 20*s.* a week. I should say that the average earnings of weavers, bad and good, would not be above 15*s.* a week. We have two shops not under the Act. There are 28 looms in these shops. We do not carry out the half-time system there. There are twelve children there; eight of them are under 13, and four are above. I do not think that the winders in the hand-loom shops ought to be under the half-time system, so much as the children who are employed in mills, where they have to attend machines. Wherever steam-power is employed the persons who work at the machines must keep constantly at work. But in hand-loom shops the men do not work incessantly themselves, nor are the children required to be always working. In fact they are not working two-thirds of the time that they are in the rooms. There is not always work for them to do. Sometimes quick children will fill the bobbins, so that they will last the men for an hour, and they will have nothing to do all that time. A half-time winder, winding for one loom, can do as much work in a morning as will last a man for the whole afternoon. I mean to say that there is no call for the half-time system. The objections to the system are that the earnings of a child only working half a day are so trifling that parents will not send their children to the carpet shops, though there is no other work in the neighbourhood for them. We have had two or three cases of weavers leaving this shop because they could not get winders.

AT MR. W. ARMYTAGE'S, CARPET MANUFACTORY, SMITHIES BRIDGE MILLS, HECKMONDWICK.

8. *Mr. W. Armytage.*—I have about 60 or 70 looms. They are in shops detached from the mill. I object to the Factory system, because I object to being subjected to the interference of the inspectors. I do not think there would be a great difficulty in carrying out the half-time system with the winders. The

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men generally employ their own children. They are generally boys of ages between 8 and 13. There are not many mills near where half-timers are employed. The mills are chiefly blanket, carpet, and woollen mills. The regular hours in carpet shops are from 6 a.m. to 7 p.m. There are no regular times for meals. The only question would be whether the children could be got to come for half the wages they now get, viz., 3*s.* a week. The average earnings of carpet weavers are 15*s.* per week. That does not include the money he pays for winding. The doors of carpet shops are always locked up at 7 p.m.

9. *Thomas McDowell*, carpet weaver.—I have two boys of my own who wind for me, and another. One is 11 years old. He has worked two years. The other is 9, he has worked about six months. He is not a good winder yet. It is very common for boys to have been winding for a year, and yet not have learnt to wind properly. Bad winders break the worsted, and thus cause a loss to the master.

10. *Thomas Humphreys*, carpet weaver.—I have a boy of 13 years of age, who has wound for me four years, and he is not a good winder yet. I have spent many weeks in teaching boys. I have to get off my loom from time to time to go and help them. Teaching boys takes three days away from the time we want to finish a piece in.

AT MESSRS. FAIRFAX KELLY, AND SON'S, CARPET MANUFACTORY, HECKMONDWICK.

11. *Mr. F. Kelly.*—I have about 230 looms. The rooms in which these looms are are under the Factory Act. The winders are some under 13, and some above that age. There is no difficulty in getting the half-timers, but there is a difficulty in getting children above 13 to wind. There are about 60 wheels to the 230 looms. Some of the wheels are worked by women, who wind for six looms at a time. About 30 or 40 winders are under 18 years of age. About 12 or 14 would be half-timers. A woman who works for six looms can earn 7*s.* or 8*s.* a week. The girls and boys between 13 and 18 earn about 5*s.* a week. It would require two years learning before a winder could earn as much as that. They generally begin at about 10 years of age. They earn 2*s.* then as half-timers. The men can pay them as much as that. We have had to send six or eight home who were too little to do the work well. They had all passed the doctor. They were about 9 years old. We have another shop, which is not under the Act. There are 14 winders there, all under 13. They work whole days. The men in our shops under the Act are continually changing. In the other shop they do not change. I think it would be better to allow children to work as winders whole time at 11 years of age. The winding is easier work to learn than mule spinning. Piecing is easy work, and only requires about a month's learning.

12. *William Thornhill*, winder for Dutch carpet weavers.—I am going 12. My brother Joseph is going 9. We wind for six looms. We do half-days each. We have both been six months at it. I was winding in London for nearly three months. We earn about 2*s.* 6*d.* each.

13. *John Barker.*—I am going 14. I have worked four years here. I worked three years as a half-timer for my father. After a month I was able to wind without wanting my father to help me.

AT MESSRS. ATKINSON AND CO.'S, BLANKET MANUFACTORY, HILL HOUSE, HECKMONDWICK.

14. *Mr. J. Atkinson.*—In the manufacture of blankets the hand looms are gradually giving way to the power looms. A boy must be at least 15 years old and a big strong lad to be of any use at a blanket loom. There are, I should say, about 500 blanket hand looms in this neighbourhood besides the power looms. If the bobbins are not filled at the mill, it would require about one boy to each loom to wind, or one woman to every two looms. Boys ought to be about 9 or 10 years old. I have no boys at all to wind; I get the worsted spun on my bobbins at the mill. When I cannot get the bobbins filed at the mill I employ two or three women to wind. Our hours of work do not average 10½ per day through the week. The work is very heavy, they could not do it. In the last six months only three men have ever exceeded 10½ hours in a day. One of them once worked all night.

15. *William Frudd*, manager to Messrs. Taylor, linen manufacturers, Barnsley.—I should think that there are still more than 1,000 hand looms in Barnsley. The hand-loom weavers' shops are generally the cellars of their little houses. In some there are only two looms, in others as many as six; never more than that. The weavers generally have children to wind for them. There would be one winder to every two looms. Weavers' wives also wind for them. Children begin to wind at 8 years old. A man working 12 hours would keep a child winding for six or seven hours. The winding is very easy work. There is not much work now for the hand-loom weavers, owing to the increase in the number of power looms in the mills. What work they get is generally given them by the large mill-owners. The manufacturers use their power looms for making the better kinds of goods, and get the commoner goods made by the hand-loom weavers. It would pay them to make the cheaper kind of goods with the power looms if they had more of them. Probably in a few years there will be few or no hand looms left.

16. *William Rushworth*, hand-loom weaver, Becket Square, Barnsley.—I have six looms in my shop. I have not work for more than two or three. The yarn is wound either by children or women. I get my yarn wound for me by a woman who lives near. Our trade is in a bad way.

REPORT on HEALD KNITTING, by Mr. H. W. LORD.

TO HER MAJESTY'S COMMISSIONERS.

Heald Knitting.

Mr. H. W. Lord.

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GENTLEMEN,

1. A heald is an open knitted framework made of cotton, and fitted to looms to raise the threads of the warp in the process of weaving. It consists of a double line of loops united by a series of small rings, each of which joins one of the upper to the corresponding lower loop. Although comparatively few persons—the number being reckoned rather by hundreds than by thousands—are employed in making healds, the conditions of labour are in many respects so exceptional as to require separate notice.

2. The manufacture exists alike in towns and in villages, being often mere cottage work, wherever weaving mills are to be found. Healds are not unfrequently made in the mills where they are used, and also on premises where steam-power is used for that purpose only, and where nothing else is made. In

both cases the employment is treated as one under the Factory Acts; but much is still done by hand, and under circumstances not unlike those of the fustian cutters, who formed the subject of a special report to you last year.

Heald Knitting.

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3. Such portions of the accompanying evidence as relate to village work has been obtained in Mottram, a village in Longdendale, near Ashton-under-Lyne. From the last-mentioned town, and also from Stockport, Oldham, and Manchester, I have received my information respecting heald knitting in more populous places.

Age.

4. In country places, and in some towns, children begin to "reach" as young as 7, and even 6; "little "fingers are best" (No. 2). Mr. Coles informed me of one case in which a child had begun at 5 years old. (No. 9.) Even in towns many have begun before they were 8.

Sex.

5. Children of both sexes "reach," but boys seldom continue after 8 or 9 years old. The knitter and the topper or bottomer are almost always females.

Number.

6. At one cottage in Mottram 17 had been working at one time, but the usual number is 7 or 8. In towns more are collected together; often about 20. In one place at Ashton 90 were said to have been working in good times. Nothing was being done at any of the places visited by me, as the whole business was at a stand-still for want of cotton.

Hiring.

7. The knitter is paid by the piece, and hires and pays the little children who "reach" for her. The topper or bottomer is not usually hired by the knitter, but by the master for whom both work.

Wages

8. A reacher earns from 1*s.* to 1*s.* 6*d.* a week, and a bottomer about 2*s.*

State of place of work.

9. In country places the chief room in a small cottage is generally the only workroom, "every stick, "except just the shafts and seats they use," being cleared out. They are of course very crowded; the close heat in summer, and the cold draughts and changes of temperature in winter, being equally objectionable.

10. Some of the larger and newer workrooms in the towns are clean and tolerably airy; other rooms are small and unwholesome. The dirty state of one or two which I visited was caused solely by neglect, the work itself being particularly cleanly.

Nature of employment.

11. The "reacher," a child of 6 or 8 years old, and the knitter, usually a girl of 16 or upwards, but occasionally as young as 12, work together at a knitting frame about 3 feet in height and 5 feet in length, and consisting merely of a light lathe resting on wooden supports at each end. The two sit on opposite sides of the frame—the reacher on a low stool, the knitter on a chair. The object of the work is to form the lower (or upper) line of loops on to the single line which the bottomer (or topper) has before made separate. The reacher has to hold up in turn one after another of these lower loops to the knitter, who passes a bobbin full of thread through it to form the upper loop and the ring of thread which couples them.

12. The bottomer, who, though sometimes only 8, is generally 12 years old or more, stands at a similar frame alone, and makes the single line of loops from the yarn, using a bobbin of thread for netting.

Hours of work.

13. Many of these little children have actually worked 14 hours a day as a regular thing. "I used often "to go to sleep at the work," said one of 13, who had worked from 6 years of age for 14 hours a day, so long as there was work to do; "then the knitter would hit me to wake me up" (No. 4). Another, who, however, had not begun till 10 years old, "had often and often to work from 6 a.m. to 8 and 9 p.m.," though the usual time was from 6 a.m. to 6 p.m. (No. 1). This took place in country districts; but even in Ashton and Stockport, where some are said to begin work at 6 or 7 years old, the ordinary hours are from 6 a.m. to 6.30, or 7 p.m.; and from the statement of Mr. Morris (No. 7), regarding the great pressure at uncertain times, it is quite clear that Mr. Coles is correct in asserting that in towns also, "in busy seasons, when they are pressed to finish by a fixed time, great enormities are "practised in the way of long hours" (No. 9).

Meal hours.

14. In the matter of meal-times also there is much to be regretted, especially in country work. Children of so tender an age as I have described have either to get their breakfast before they come, and carry a bit of bread and butter after dinner back for tea, or eat their meal at home as fast as they can, and hurry back to work. In towns they seem to have the dinner hour allowed, but in some cases, they work till 6.30 p.m. without tea, that plan having been adopted in preference to working till 7 p.m. and having time allowed for tea. Where the regular day's work was 14 hours, an hour was allowed for dinner and half an hour for tea.

Physical condition.

15. I have no doubt whatever, in spite of assertions to the contrary, that the witness Shaw (No. 1) states no more than the truth in saying that "many who have to work long hours at a very young age are," as she stated herself to be, "very much crooked, both legs and shoulders." She, it is true, stated, in answer to a question from me, that she had always had very bad health; but, on the other hand, she had not begun until so late, comparatively speaking, as 10 years old, and, though sadly deformed at the time of my seeing her, did not appear particularly weakly. The witness Garlick also (No. 3), mentioning the case of her grand-daughter, "whose back is quite crooked," attributed that result solely to her "being so young "at long hours." And the opinion of Mr. Pomfret, a medical gentleman whom I consulted on the subject, is quite consistent with these statements, for, although he has "never watched a particular case "so as to trace deformity or disease directly to their particular causes, he is thoroughly convinced that "it must lead to the very worst consequences" (No. 8).* It should be observed that the above mentioned are cases happening in a village on the hill-side, in a bold, open country,—cases, moreover, to which my attention was especially directed by the vicar of the parish as specimens, in his opinion, of the pernicious effects of the system, and not isolated instances, the work both in town and country being, as I have before remarked, at so low an ebb that, by merely visiting the places of work, I could have obtained no information whatever.

Moral condition.

16. "They haven't much time for school, of course." "My grand-daughter . . . is 11 years old. . . . "She can read a bit now, but never had any schooling till she went to union school" (Nos. 2, 3). So in Oldham I learned that the little children were "very poor and had no learning; many cannot read "at all" (No. 6 and *see* No. 10). The evil of the existence of such a trade, under no provisions for

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* Mr. Pomfret speaks also of "drawing in," another process supplementary to heald knitting, as being open to the same abuse. It consists in drawing the threads of the warp through the eyes of the heald.—H. W. L.

Heald Knitters.

Mr. H. W. Lord.

education or reasonable hours of labour, is forcibly shown in the case mentioned by Mr. Coles, the Sub-Inspector of Factories (No. 9). His attention had, in one of his official visits to a cotton mill, been attracted to a girl who seemed "very small to have been passed as a full timer." On inquiry he learned that she had begun to work at 5 years old from 7 a.m. to p.m. at heald knitting; she could not read, had never been to any day school, and only occasionally to Sunday school. This was in a rural district. In such places this trade would seem to take the children even from the infant school.

I am, Gentlemen,
Your obedient Servant,
H. W. Lord.

EVIDENCE.

Mottram.

g.

MOTTRAM.

The Rev. J. H. Jones, the vicar of Mottram, to whom I am indebted for the interviews I had with the 4 following witnesses, informed me that I might rely upon the accounts given by them, and from his own experience generally confirmed their statements.

At the time of my visit there was no work for the heald-knitters, and there had been none for some time. The witness Wilkinson, however, sent for a neighbour's child, who had "reached" for her, and on the return of her own daughter, who was a knitter, from the sewing school, the two showed me the whole process, so as to illustrate and confirm the description given me by the witness Shaw.

1. *Hannah Shaw.*—I am 18 years old. Eight years ago I began to work at heald-knitting; many begin younger than I did. I know of two children, a brother and sister, who began before they were 7; they are now in a mill. I don't know whether they are crooked at all; I am very much, both my legs and my shoulders. Many are, who have to work long hours at it very young.

I often and often had to work from 6 a.m. to 8 and 9 p.m. The usual time, when I worked, was from 6 a.m. to 6 p.m. I wasn't with any relation but used to go from home to work. I had breakfast there before going to work; came home for about an hour for dinner, and took some bread and butter back with me for tea.

The master or mistress generally get two or three of their neighbours' children to come in and work. It isn't done so much at the knitter's own home, though the only work-room is just the chief room in a cottage. There are not often more than seven or eight together in one place.

The knitting-frame is about 5 feet long. The little child, who is called a "reacher," sits on a low stool on one side of the frame, opposite the knitter, who is a big girl or woman. The knitter sits in a chair on the other side of the frame, and passes a threaded bobbin through the open loop, which the child holds up to her, so as to lap it over the waxed thread; that is "coupling." They shift their seats from time to time along from the one end of the frame to the other, as the loops at the upper end get coupled. If they don't move often enough, the child will have to reach too far to its left side—for of course the knitter's reach is much longer than the child's—and so they get their shoulders up. A "reacher" gets paid 1*s.* 3*d.* or 1*s.* 6*d.* a week. The knitter is paid by what she does.

At about 12 or 14 a child gets put to "bottoming;" that is done by one alone, and generally on the further side of the room. The bottomer gets 2*s.* a week. She makes the loops which the knitter afterwards couples. That is even more tiring than the reaching, for it is all standing work: standing in one position and stooping over a board between two shafts with the bobbin to lap the thread round. The yarn is brought in shanks from the mill, and the bottomers begin on it. It was that work that made my father take me away from heald-knitting. He thought my legs were growing crooked from the standing. It was my own doing that I ever went to it. I always had very bad health, and it seemed a less unhealthy work than in factory.

The mistress for whom I worked had a daughter, who was very much deformed by the work she did in heald-knitting, so every one said.

2. *Mrs. Wilkinson.*—In good times I have had as many as 17 girls knitting healds and bottoming, counting reachers and all. We clear the room of every stick except just the shafts and seats they use. This little reacher is 6 years old. Little fingers are best; they don't get in the way of the bobbin, when they hold the loop up. It's nice work and does no harm. My daughter's spine was bowed long before we put her to the work. She didn't begin till she was 13; it was because she couldn't go to mill that she took to knitting, it is so much easier. They haven't much time for school of course. We teach them what we can, while they work. This little one we taught her letters, and to count. They have to count out loud for the knitter to tell the number of loops she has coupled.

They make healds by machinery now, but those are not like hand-made healds; the machine can't ease the knot as the hand does. At the mill down yonder they tried patent healds and machine-made healds, but they had to come back to us after all.

It is always done like this in cottages. There would be a many agate, four or five cottages in most of the villages about, if the mills had work now.

3. *Ann Garlick.*—My grand-daughter, Mary Mills, began before she was 6 years old to "reach" for a heald-knitter. She used to work 12 and 14 hours a day, as often 14 as 12, for 1*s.* 3*d.* a week. She used to come home for breakfast, dinner, and tea; always ate them as fast as she could, and went back again. She is 11 years old now. Her back is quite crooked; one of her shoulders up. That was done by being so young at long hours. She is now in Ashton Union house. I tried to get her out for you to see, but the governor wasn't in, so I couldn't. She can read a bit now, but never had any schooling till she went to Union school.

I have lived all my life in Mottram and Broadbottom. There's not a quarter of the work there was for heald-knitters; still you'll find them everywhere, all up and down, at it, when the mills are full, although they knit healds by machine, and one machine is said to do the work of nine knitters.

4. *Harriett Fagan.*—I am 13 years old. Began to be a reacher at 6 years old. Used to work 14 hours a day regularly, but had an hour for dinner and half an hour for tea out of that. Worked for Mrs. Hall. She gave me 1*s.* 6*d.* a week. There were one or two besides me there. I used often to go to sleep at the work; then the knitter would hit me to wake me up. She never hurt me much. At 8 years old I was a "bottomer," and earned 2*s.*

ASHTON-UNDER-LYNE.

Ashton-under-Lyne.

g.

5. *Mrs. H. Williams.*—When times were good we have had as many as 30 knitters working here, besides giving out a deal to be done at home: each knitter has her reacher and her topper or bottomer, so there would be 90 or more. That was only two or three years since.

There are three or four more places like ours in the town, only not so large. There are places at Stockport too. Our hours are from 6 a.m. to 7 p.m.; that is, to 6½ p.m., for they take their half hour for tea at home, instead of stopping the work, and so get away earlier. We never keep them later. Sometimes they may take some home with them, where two or three live together, but they never stay here.

The reachers begin at 6 or 7 years old. Working all day long doesn't hurt them. I began at 7 years old, and worked all night sometimes. That was at home for my father. It did me no harm.

Ours are nice large rooms. In the smaller places it is worse for them. I believe they work them longer in Mottram than they do anywhere in Ashton.

There are much fewer hand-knitters than there used to be. The patent or machine-made healds are quite as good as the hand-made, but the steam power would be too costly in a place like ours. There are still, however, many mills where they do not make their own healds. We make a great many also for foreign places. Counting cottages and shops, and all, there would still be a large number of persons employed at heald-knitting in different places, if trade were to revive.

OLDHAM.

Oldham.

6. *At Mr. Wolstencroft's* I obtained the following information from a man, whom I saw here in Mr. Wolstencroft's absence. I forgot to ask his name:—

"There are many healds made by hand in all the towns about, and will be, for the hand-knitted healds last longer, and some manufacturers will have no others. I have worked at Bury and Stockport, and Manchester too some years back, and know about most of the places. Some work both by hand and by machine: some few only by machine, but many of the mills make their own. When they use machines out of the mills they are still under the Act, I think. They keep factory hours, so far as I know, but certainly I never heard of or saw any inspector, where I have been, though they made them by machine.

"The machine just supplies the place of the topper and reacher. The knitter has still to couple by hand. They are girls of 15 and upwards who knit at the machine. The reachers often begin as young as 7 and 8, even in the towns, and some at 6 years old They will work from 6 a.m. till 6 p.m., with meal times. If they stay till 8 p.m., they have seldom come much before 8 a.m."

Mr. Wolstencroft's niece confirmed this statement, and also told me that the little children were very poor and had no learning. Many could not read at all.

MANCHESTER.

Manchester.

7. *Mr. Morris.*—I don't think factory regulations could be applied to us, because our work comes in so irregularly. I should be glad enough to be under the Act, if my work could go on, but I am sure it couldn't. There is no working stock with us; it is, and always must be, all to order. You see, each different kind of cloth requires a different kind of reed and gear; so until the manufacturer has his orders from his customer, he can't tell us what he wants; besides which it fluctuates very much; not in seasons, but one week with another. I have been full of work one week, and had nothing in the next. Everything, too, is wanted in a hurry; for instance, yesterday morning an order came in at 11 to be completed by 5 p.m., we delivered part then, and shall send the rest at 4 p.m. to-day. The knitters are paid by the piece. They hire and pay their own reachers. We have nothing to do with them. We reckon 5 persons to 2 frames, for one topper will keep two frames supplied, and each frame has a reacher and a knitter. They have the reacher younger in country places than in towns, but I dare say they will begin before 8 years old in towns often. There will still be several hundred persons employed in making healds by hand throughout the cotton manufacturing district. In Manchester there are about four employers. You may say they will employ 75 to 80 hands altogether. In some towns, Ashton and Stockport, for example, there are more. The work is given out there very much. One or two of the leading men there will have each of them 90 or 100 hands, in and out working for them.

8. Extract of Letter from Henry L. Pomfret, Esq., Certifying Surgeon, &c., Hollingworth, near Manchester.

I do not think there is anything injurious in the occupation itself of heald-knitting, but I believe it is the custom to employ children at a very tender age, before they are 6 years old, and the very fact that they may and frequently do employ them from 6 and 7 in a morning until 7 and 8 at night, set on a stool with their arms stretched out, and without any stated time for meals, is quite sufficient to call for legislative interference.

I have never watched any particular case so as to trace deformity or disease directly to this particular cause, but am thoroughly convinced it must lead to the very worst consequences.

"Drawing-in," which is drawing the threads of the warp through the eyes of the healds, is also open to the same abuse, being generally done in the cottages.

9. *R. W. Coles, Esq.*, sub-inspector of factories, Manchester.—I think from all I hear that heald-knitters require regulation more than fustian cutters do. The power-workers are under the Factory Acts, but there is really much more reason why the hand-workers should be under restriction, for they employ much younger children, and work them, as it is, much longer, and in small rooms. In the places with which I am acquainted, where healds are made by power, they have rooms of a tolerable size, and girls of 15 or 16, not younger, to work.

That trade suffers especially from having a number of small middlemen, who take out work from the larger employers, and have perhaps four or five girls and children in a small cottage, working hours which the others would be ashamed to work. The wives of tradesmen, in a small way of business, take work out in that way, and have heald-knitters in an upper room working for them. I know of one over the shop of a druggist in a neighbouring town. In busy seasons, when they are pressed to finish by a fixed time, great enormities are practised in the way of long hours.

I noticed a little girl at a mill I was inspecting at Failsworth the other day. She struck me as being very small to have been passed as a full timer, so I inquired of her, and learnt that she had begun at 5 years of age to "reach" for a heald-knitter in the neighbourhood. She told me she usually worked at that age from 7 a.m. to 9 p.m., some interval being allowed for breakfast and dinner, but none for tea. She could neither read nor write, and the only schooling she had had was through an occasional visit to Sunday school. She said that there had been about a dozen other girls of that age and upwards working with her, Heald Knitting.

Mr. H.W. Lord.

Stockport.

g.

STOCKPORT.

10. *At St. Thomas Day School for Girls* I found 10 or 12 who had, until the general stoppage of the cotton mills, been employed in making healds. Their ages varied from 8 to 13. Some had begun to "reach" as young as 7, one at 6 years old, and had been knitters at 12. They stated their hours of work to have been from 6.30 or 7 a.m. to 6, 7, or 8 p.m., and occasionally till 9 p.m. Their earnings were generally 1*s*. 6*d*. a week. One had worked twice in the week from 6.30 a.m. to 8.30. p.m., and received 1*s*. for the week's work. Some of them had been working where several others of about the same age were employed; others had "reached" for a neighbour who had only one or two to work with her. There was nothing in the appearance or these children, or in the accounts given by themselves or their schoolmistress to indicate to an unprofessional inquirer that their health had been injured by their work.

The mistress stated that all these girls were very backward, and in the lowest classes.

The TOBACCO MANUFACTURE in GLASGOW, LONDON, and LEEDS.

To Her Majesty's Commissioners.

The Tobacco Manufacture.

Mr. F.D. Longe.

H.

Gentlemen,

A great number of young boys are employed in the manufacture of tobacco, especially in making roll or pigtail. The process of making roll tobacco is called spinning. For every spinner there are three children employed In Glasgow, where this manufacture is carried on to a greater extent than in any other town, there are about 700 boys, of ages varying from 8 to 13, employed in the spinning shops. Besides the children employed in the spinning branch, a considerable number are employed in packing cut tobacco in other parts of the kingdom, and in making "bunches," that is, preparing the tobacco leaves for cigar makers. The total number of children employed in the Glasgow shops, at the time of my visit in 1864, was 655.

2. The boys employed by the spinners are taken from the poorest class. In Glasgow, until late years, "tobacco boy" and "street ragamuffin" were synonymous terms. Their habits and character, however, have been considerably improved by the tobacco boys' school, which has been established about two years, and is supported by the manufacturers in the city.

Hours of work.

3. The regular hours of work in the spinning shops are not so often exceeded as in many other trades. In Glasgow the regular hours are from 6.30 a.m. to 6 p.m., with two hours deducted fcr breakfast and dinner; overtime to 8 occurs occasionally, but only for two or three weeks in the year. At Leeds the spinners begin to work about 6½ or 7 a.m. and seldom work beyond 7 p.m. In London work commences at 8 a.m. and the boys generally get away about 7 p.m. In some shops, however, boys have been kept to 10 p.m. for a whole week.

4. The work of the children employed in the tobacco manufactories is very light and simple, and is equally suited for girls as for boys. Girls are employed in the spinning shops at Leeds and Newcastle. The first operation they are put to, is that of turning the wheel for the spinner; no skill or strength is required for this work. The other children are employed in stripping or preparing the tobacco leaves for the spinner, or in "pointing" or placing them on the table ready for his hand. The stripping is sometimes done by women. In the spinning shops at Glasgow, the tables at which the men work are surrounded by a number of small boxes or hutches about three feet square, which each contain, buried in tobacco leaves, a dirty little half-clothed boy, who is engaged from morning to night in separating the leaves, pulling out the stalks, &c.

5. The children are generally hired by the men. In Glasgow their wages are very low, the majority getting from 1*s*. 3*d*. to 2*s*. 6*d*. a week. The maximum wage earned by any of these boys is 3*s*. 6*d*. or 4*s*. In London a pointer sometimes makes 10*s*. a week. (See Evid. 13.) The lowest wages are 2*s*. 6*d*. At Messrs. Taddy's the boys are hired and paid by the firm. (See Evid. 30.)

6. The Glasgow manufacturers have for some time applied themselves to the improvement of the moral and educational condition of the boys employed in their works. The tobacco boys' school is open from a quarter past 7 to 9 o'clock every evening. It does not appear, however, that the average attendance has ever represented so much as one half of the boys employed, notwithstanding the exertions of the employers, and the prizes and other inducements offered.

The following returns, kindly forwarded to me by the Messrs. Tod, show the ages and educational conditions of these boys in July 1864, after the night school had been established for two years.

Under 11 Years of Age.	Above 11 years of Age.	Can read only.	Can read and write only.	Can read, write, and cypher.	Cannot read, write, or cypher.	Total.
269	386	310	46	81	218	655

I am, &c.
Francis D. Longe.

The Tobacco Manufacture.

Mr.F.D.Longe.

H.

EVIDENCE.

MESSRS. S. MITCHELL & SON'S, TOBACCO MANUFACTURERS, 51, ST. ANDREW'S STREET, GLASGOW.

1. *Mr. Duncan McMillan*, managing clerk.—I believe there are more hands employed in our manufactory than in any other tobacco manufactory in the city. In our works there are 40 spinners employed, and each spinner employs three boys. The tobacco works here are principally engaged in the manufacture of pigtail or roll tobacco, and the men and boys are employed in spinning or rolling and preparing the leaves. The youngest boy turns the wheel, the second boy strips the leaf, and the third spreads or points the leaf on the tools for the spinner. There are no girls at all employed in our shops. There would be 120 boys altogether. Some of them would be as young as 10; very few over 13. There are plenty of boys to be got. Our regular hours are from 6½ in the morning to 6 p.m. We seldom work after 6, only two or three times a year, and then we never work after 8.

2. *David Logan*, spinner's boy.—I am 9 years old. I have worked half a year. I twist for James Tod. I get 1*s.* 3*d.* a week. I have been to school. I went to a school in Chalmers Street. I can read the tenpenny books. I don't go to school now. I go sometimes on Sunday. I come at 6½. I go away at 6. I go home at 2 to dinner. I come back at 3. I go away at 9 for breakfast. I have an hour for breakfast.

3. *William Logan*, errand boy.—I am 12 years old. I have worked here 4 years. I get 3*s.* 6*d.* a week. I was pointer for 3 years. I have never been to school except for a month about. I can read sixpenny books. I begin to work at 8, and go away at 6. I run messages. I never stop after half-past 7. I have generally done my work at 6.

4. *William Still*, manager of spinning department.—The spinners' boys are all hired by the men. Their wages run from 1*s.* 3*d.* to 3*s.* 6*d.* The pointers get the highest wages. The strippers and turners average 9 years of age. The pointers average 11 or 12 years of age.

TOBACCO MANUFACTURERS' SCHOOL, OLD WYND, GLASGOW.

5. *Mr John Gorril.*—There are not more than 800 boys employed in the tobacco trade in Glasgow. I should say there were about 700 in the shops now. This school has been established and managed by the employers. They nearly all encourage and support the school. The children pay 1*d.* a week. All the children who attend are boys employed in the tobacco works during the day. School begins at a quarter past seven, and lasts till 9. There were about 300 boys in average attendance during the winter months. The boys are decidedly not so brisk and fresh to learn and attend as if they had not been at work before they came to school, and if the teacher does not interest them, or the room is close, they soon get heavy and sleepy. The children are the very poorest class in the city.

MESSRS. HODGE & CO'S., TOBACCO MANUFACTURERS, 6, ARGYLE STREET, GLASGOW.

6. *Mr. Hodge.*—I think that the factory system ought to be extended to our trade. It would be a benefit to the children, and I do not think that it would be at all impracticable. I think that girls might be employed as well as boys. There might be a slight difficulty in getting the double number of children, but I do not think that there would be any difficulty after a short time.

MESSRS. JAMES WADSWORTH & CO'S., TOBACCO MANUFACTURERS, LADY LANE, LEEDS.

7. *William Kenyon*, a boy employed by a twist maker.—I was 10 last Christmas. I turn tobacco. I come at 7. I go away at 6½ at night. I have stopped to 7 or 8. I never stopped to 8 for more than two days together. I sometimes leave off at 3½ or 4 in the afternoon. I have half-an-hour at 8 o'clock for breakfast, and an hour at 12 for dinner, and half an hour at 4 o'clock for tea. (Reads well.) I was two years at the parish church school. I get 2*s.* a week. I only work for one man. It is not hard work turning.

MESSRS. JACKSON & CO'S, TOBACCO MANUFACTORY, LADY LANE, LEEDS.

8. *Mr. Jackson.*—The girls under 13 employed in my works are hired and paid by the men for whom they work. These men are spinners, who make the pigtail tobacco. It is only in that department in our trade that young children are employed. Boys are sometimes used for the same work. Many men prefer girls. The work is very simple. I do not see that there would be any difficulty in carrying out the half-time system of the factories with respect to their girls. I think, however, it is very probable that the men would not take the trouble of getting the two children required, but would get one over age. A spinner must have three assistants. There is nothing in this work that requires nightwork. As to the rule that no children or young persons should be employed after 6 o'clock, we have about six youths whom we should want to employ after that time occasionally. Such a rule would be inconvenient at first. There are not many children employed in the tobacco trade at all. I do not suppose there are more than than 400 spinners in the whole of England.

9. *C. H. Harpham*, cutter's assistant.—I am going 15. I have worked one year here. I used to work at Wadsworth's. I began there at 9 years old. I was a spinner there. I can't read. I got 2*s.* 6*d.* a week when I first began to work. There were 7 of us at home then. Father was a cloth dresser. I get 4*s.* now. I come at 6½ on all days except on Saturday, when I come at 6 o'clock. I go away at about 7 in the evening. Sometimes I stay till 8, once or twice a week. I never worked later than 8½. When we have a break-down with the engine we work to 8½. It is very seldom.

10. *Edward Whinhem*, foreman of spinners.—We begin work at 7 in the morning and give over at 7 at night. The children never work after 7. They always have half an hour for breakfast at 8 o'clock, and one hour for dinner at 12, and half an hour for tea at 4.30. I believe this work is considered particularly healthful for children. They earn from 2*s.* to 6*s.* or 7*s.*

11. *Catharine Molloy*, spinner's assistant.—I am 13 next midsummer fair. I do not think I have worked a year. I can't read. I never went to school. I have no brothers or sisters. Father works at the pit. I come at 7 and go away at 7. I never stop after 7. I turn the wheel. It is not hard work. I am not tired when I go home. It is very easy work. I could do it the first day I came. I got 2*s.* a week when I first came.

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12. *Eliza Liversedge*, spinner's assistant.—I am going 14. I only began last Saturday. I get 2*s*. 6*d*. week. I worked four months at Wilkinson's flax mill. I went as a full timer. I got 4*s*. 3*d*. a week. I left because it did not agree with me. I doffed. (Can't read.) I never went to work before I was 13 years old.

MESSRS. T. BRANKSTONE & CO'S., TOBACCO MANUFACTURERS, 8, SHOE MAKER LANE, DOCTORS COMMONS, LONDON.

13. *John Osborne*, foreman of spinners.—There are on the average four boys employed to each table. The youngest turns the wheel. He gets 3*s*. a week. He is generally 10 years old when he begins. The boys ages, taking them all together, would average 12 years. Our regular hours are from 8 in the morning to 7 at night. The shop is never open before 8. The spinners work by piece work, and pay their boys. They get as much as 2*l*. 10*s*. a week after paying their boys, some weeks. They stop from 1 to 2 for dinner. The men and boys dine in this room. Some of them go home. They stop again again at 4½ for half-an-hour for tea. Some of the pointers get 10*s*. a week. The turning requires no practice. The stripping does require practice.

14. *James Bone*, spinner's boy.—I strip and point and pack, as I'm wanted. I am getting on for 14. I have worked here about one year and a half. I never worked before. I can't read. I was not a year at school. I have one brother and three sisters. I get 4*s*. 6*d*. a week. I come at 8 in the morning. I generally begin to work at about a quarter to 9. I give over at 7. On Saturdays we leave off at 2 o'clock. I have the same pay on Saturdays. I stop an hour, and sometimes more than an hour, for dinner. We stop at a quarter to 1. I stop again at 4½ for half-an-hour. I go home to dinner. I get my tea here. I have never had the doctor in my life. I have been to Sunday school, but I don't go now.

15. *James Treacher.*—I am past 12. I have worked here about two years. I point. I get 4*s*. a week. I have been two or three months at school. I can't read. I learnt to read a little at school. I was not at work before I came here. I go home at 7 at night. I never stay after 7. I have three brothers and three sisters. I have lost my father. My father used to work here. I have two brothers in this trade. I always get my dinner in their shop.

16. *Richard Harris.*—I am getting on for 9. I work for Mr. Diffy (an old man). I get 2*s*. 6*d*. a week. I have been to school. I can read (can read newspaper well). I was about four or five months at school. I have only just come to work here.

MESSRS. HUXLEY & CO'S., TOBACCO MANUFACTURERS, 12 & 13, WHITECHAPEL ROAD, LONDON.

17. *Mr. Clarke*, proprietor.—There are two departments in our manufactory in which we employ children. We employ about 30 girls in moulding tobacco, *i.e.*, in making ounce or half-ounce packages of cut tobacco. In the spinning shop about 20 boys are employed but not by the firm; we contract with a man to make our roll tobacco and he finds the hands. The boys employed in the spinning shop are probably the lowest class to be found in the neighbourhood. It is only lately that I have taken girls instead of boys to pack tobacco, I prefer the girls. We pay them weekly wages, they begin at 2*s*. 6*d*. and get up to 4*s*. Their regular hours are from 8½ in the morning to 6; but they scarcely ever work beyond 5 o'clock. All our girls stop with us until they get too big for the wages we give.

Packing Room.

18. *Margaret Swanblack.*—I am going on for 12. I have worked about eight months. I come at 8½. I go away sometimes at 5, sometimes at half-past 5, and sometimes at 6. I have stopped. Once I stopped to 8. We all stopped to 8 then. It was only once since I have been here. I get my dinner at 1. I stop to 2. Some go home for dinner; I dine here. I don't stop for tea, I get my tea when I get home. I go to night-school on Tuesdays and Thursdays. I go to the school in Buck's Row. There are about eight girls go with me from this shop. School is from 7 to 9. I am learning to read. I can't read yet. I was about a month at school before I came to work I get 2*s*. 6*d*. a week. I have no father. I have three brothers and two sisters; they all work but one. I have packed 20 lbs. this morning in ounce packets.

19. *Jane Cotton.*—I am going on for 11. I have been three months here. I can read a little (cannot read). I am learning at Buck's Row. I never went to school before I came. I get 2*s*. 6*d*. a week. I have two brothers and four sisters. My father is a waiter. Three of us work.

20. *Eliza Cotton.*—I am 14 on the 11th of next February. I have not worked a year yet. I can read a little. Before I came here I went out to nurse the baby. I never went to school till I came here. I got 2*s*. 8*d*. a week for nursing. I go to school now on four nights in the week. I go to Buck's Row. We pay nothing. I am learning to read the Testament. I go there at 7 and leave at 9. I pack about 60 lbs. in the day. I go away generally about 4 or 5 in the afternoon. I have stopped sometimes to 8. I never stopped more than one night in the week to 8. I may have stopped 20 times altogether to 8.

21. *Sarah Doden.*—I am 14 next March. I have worked here two years and two months. We all begin and leave off at the same time. Once only I stopped to 12. I have twice stopped to 10. We never stopped to 8 more than twice a week. I go away for dinner. We have an hour for dinner. We never work on without stopping for dinner.

22. *James Mortimer*, errand boy.—I am 12. I have worked here four or five months. I worked at a hatter's before that. I got 2*s*. 6*d*. at the hatter's. Before that I worked at a tobacco spinner's at Snow Hill. There were five boys in the spinning room there. I left because the shop was going to be pulled down. I was four months there. Before that I was a bunch maker at a cigar maker's. I was seven weeks there. I got 1*s*. 6*d*. a week. I was 11 years old when I was there. I was three years at school. I was 8 when I first went. I paid nothing. It was a charity school. Father is a foreman of scavengers. I have three brothers and one sister. Three of them don't work. I begin at 8. I always began at 8 at all these places. I go away now at different times, sometimes at 4½, sometimes at 6½. I have once stopped to 8. I never stopped beyond that. I used to stop every night to 9 at the hatter's. I stopped to 8 at bunch making every night. We used to work to half-past 7 at the spinner's, except on Saturday when we gave over at half-past 6. At the hatter's we worked as long on Saturdays as other days.

Spinning Room.

23. *George Glover.*—I am getting on for 11. I have worked about a year. I come at 8. On Saturday I come at 7. I go away at 7. I have stopped to 10. I worked to 10 every day in the week except Saturday, for one week. I never worked to 10 for more than two weeks. It was four months back when I worked to 10. We have often worked to 8. We don't now. We don't have so long for our dinner. We have only half-an-hour now. I generally go away at 7 now. on Saturdays we leave at 3 or 4. I have been to school over a year. I can't read much. I get 3*s*. a week. Before I came here I went to school. I used to read Testament at school. I never go now. I have been to Sunday school. I live in Hackney Road.

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My father is dead. I have one sister and two brothers.

24. *Daniel Desmond.*—I am getting on for 14. (Reads well.) I have worked six months. I was all the time at school before that. My father is a bricklayer's labourer. I have two brothers and one sister, all younger than me. I went to school at George Yard. It was a ragged school.

25. *James Paris.*—I am getting on for 10. I have been here one year and five months. I turned when I first came. I got 2*s*. 2*d*. I get 2*s*. 6*d*. now. I come at 8. I generally go away at 7. One week I worked to 10. I never worked more than one week to 10.

26. *Henry Barlow.*—I am getting on for my 14th year. I have been here 11 months. Before that I worked at a confectioner's in the Borough. There were about 12 men and boys there. There we began at 7 in the morning and worked to 10 at night. We worked the same hours on Saturdays. I got 2*s*. 6*d*. a week and 3*s*. I used to make peppermint lozenges. I was a month there. I left because they gave us so many holidays; they were always sending me home because they had no work.

[I examined nine boys, and found only one boy who could read, all but three confessed themselves unable to read.]

MESSRS. SCHIFF & BROTHERS', 16, GREAT ALIE STREET, GOODMAN'S FIELDS, LONDON.

27. *Jacob Moxley.*—I am not 14 yet. I make pickwicks. I have been here three years and seven months. When I first came I made bunches. I come at 8 o'clock. I leave at 6 o'clock in the evening. I have stopped to 7, never later. I go away for dinner. All the men and boys leave for dinner. I get 4*s*. a week now. I have left school four years. I can read a little, a very little. I went to a free school in Bell Lane. I was there about two years. I never learnt arithmetic.

28. *Morris Garrod.*—I am 16. I have been seven years here. I began as call boy. Then I made bunches. I got 2*s*. a week. I generally leave at 6. I don't go to school now. (Can read a little.) I have never been to school since I have been to work. I never go on the Sabbath. I get 12*s*. and 13*s*. a week now.

29. *Abraham Myers.*—I came to England about two years ago. We use used to live in Austria. I am getting on for 14. I have worked here ever since I came to London. I was six years in school in Austria. I was five years old when I first went. We were obliged to go at six years old. I used to be at school every day from 8 to 7, with one hour at 12 for dinner. I learnt reading, writing, and arithmetic. I can read and write in German. I can't read English yet, except a little. I am learning. I go at night to Wood Street. Father pays 1*s*. a month for three of us. I get 4*s*. and 4*s*. 6*d*. a week. I have two brothers and one sister. My brothers work here. One gets 1*s*., aud the other gets 2*s*. a week. They are younger than me. My sister is only four years old. Father is a riveter. He makes rivets for the shoemakers.

MESSRS. TADDY & CO'S., TOBACCO MANUFACTURERS, 45, MINORIES, LONDON.

30. *William Chamberlain*, spinner's boy.—I am 11 on the 8th of November. I came a week after last Christmas. I strip tobacco. I turned when I first came. I get 4*s*. 6*d*. now. I come at 8 o'clock. I go away at 7. I never stopped after 7. I go away at 2 on Saturdays. We often go away about 5 o'clock, generally in the summer time. I can't read much (can read a little). I was five years at school before I came here. I go twice a week now, from 8 to half-past 9. We go to a ragged schood. There are about 50 or 60 boys there. My father is a journeyman baker. I have five brothers and sisters. All go to school except my sister.

30. *Henry Pardner*, turner to spinner.—I am going 13. I have worked here 8 months. I turn the wheel. I was five years at school. Before I came, I never worked anywhere else. I get 3*s*. 6*d*. a week. The master pays me. I go away at 5 sometimes. I never stopped after 7. I go home to dinner.

32. *Walter Haward*, packer.—I have been 14 months here. I am going 16. I worked at another tobacconists for 15 months. I moulded half ounces then. I got 4*d*. for 10 lbs. Before that I went out with the cart at another shop. Before that I worked at a toy factory. I casked leaden toys. I was 7 years old when I began, or nearly 8. I was three years at school before I went to work. Father died when I was young. That is why I went to work. I have never been to school since I have been to work. (Can read well.) I taught myself. My brother is a good scholar. None of my brothers go to school. My mother teaches us. I go away at 5 or 6, very seldom so late as 7. When I was at the toy factory I worked regularly from 7½ to 8. I have worked to 11. We used to work to 10 every other night. I get 7*s*. 6*d*. a week now.

MESSRS. ARCHER'S, TOBACCO MANUFACTORY, BROADWAY, WESTMINSTER.

33. *George Burkes*, spinner's boy.—I am 14 and a little past. I have worked here three years. I can't read. When I first came I turned the wheel. I was two years and a half at school before I came. I come at 8 in the morning and leave at 8 at night. I sometimes stop to 8½. I very seldom stop for more than a few nights together to 8½. Once or twice I have worked to 10. I got 2*s*. 6*d*. when I first came. I am a pointer now. I get 4*s*. The master always pays me. I went to a night-school when I first came. I learnt a little but I have given up going now.

34. *John Thomas Winstanley.*—I am going on for 11. I have been here going on for four months. I can read a little. I have never read any since I left school. I was two years at school. I come at 8. I go away at 8. I have stopped here twice to 10. I get 2*s*. 6*d*. a week. I have two sisters and one brother. Father is a gas-lighter. When I first came I turned. I don't know any arithmetic.

EVIDENCE on the TOBACCO MANUFACTURE, collected by Mr. J. E. WHITE.

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1. The tobacco manufacture, as carried on in Edinburgh and Glasgow, presents a feature of great and peculiar interest as regards the condition of the boys employed in it, viz., the regular provision made by the trade for their education by means of regular evening schools. This effort, which has already produced good results, is a fact well deserving to be generally known.

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2. The condition, physical and moral, of the tobacco boys in these cities is represented in the reports and evidence furnished under the former Children's Employment Commission as then very miserable. The boys are represented as still belonging to the same class, "the lowest of the low," as one employer describes them, and their earnings also are proportionately low; but to judge from the few specimens which I saw, and from the accounts given, their condition has since much improved. It was probably the very fact of their so low physical and moral condition, which, by drawing attention to itself, led to the efforts which have been made to bring about an improvement. This is the only instance which I have met with of any trade combining as a body to educate the young whom it employs.

3. Mr. R. H. Franks, in one of the reports already referred to (K. p. 9, sect. 71,) gives an account of the first establishment of a general tobacco boys' school in Edinburgh by the foreman of a tobacco manufactory. Of this school, "instituted in 1820, remodelled in 1852," some further account, showing its working at the present time, is given below (Nos. 14, 15). The school is supported entirely by the subscriptions of tobacco "importers, makers, and manufacturers" (including two or three not local), and "shopmen, spinners, and apprentices," with the boys' fees at ½*d.* each a week. The latter amounted in the year ending October 1864, to nearly 23*l.*, or about a third of the total expenditure, the use of a room being granted for the school.

4. The example was followed in Glasgow two or three years ago by the establishment of a tobacco boys' school there of just the same kind, and supported in the same manner. The boys' fees in 1863 amounted to 37*l.* 9*s.* 9*d.*, about a fourth of the total expenditure.

5. I should remark that in the inquiry which I made in Scotland, I confined myself almost entirely to obtaining information as to these schools and their working, with a few general statements from employers, another of the Assistant Commissioners having already collected information sufficiently illustrating the conditions of employment in tobacco manufactories generally.

6. From what I thus learned, it appears that the employers, notwithstanding their efforts, find it difficult to secure such a school attendance as they desire, and that an attendance enforced by law would be rather welcomed than objected to by the leading manufacturers. It appears also that the trade is of a nature which admits of being carried on within moderate and uniform hours, as it generally is; though on the other hand these hours are long for boys so young as most of the tobacco boys are, and it is shown that "during brisk trade it has frequently been found that these (*i.e.*, late) hours "unavoidably encroached upon those of the school." (No. 21.)

7. Either in Scotland or elsewhere I learned nothing of importance as regards the effect of the employment upon the health, and made but little inquiry. The medical attendant of a well arranged manufactory, employing 100 females, four-fifths of them girls, stated that he had not found any undue sickness amongst the workpeople, or anything to attract his attention to the nature of the employment. The smell is strong, but pleasant, though some beginners are made sick by it. Fresher whitewash and paint and more space and fresh air than I have found in some of the few workplaces which I have visited appear of importance in this manufacture.

MESSRS. RICHARDSON, BROS'., TOBACCO MANUFACTURERS, WEST BOW, EDINBURGH.

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8. The manner in which this establishment is conducted fully bears out the high character given of it in 1841 by Mr. R. H. Franks, who says that it "deserves particular notice." (Report K. p. 9, sects. 69, 70). The "regulations" of the manufactory, library, friendly society, &c., with the catalogue of hundreds of well chosen books, fill a book of 50 pages. The rules for securing a good arrangement of work, exact punctuality, proper treatment and supervision of the boys, cleanliness of the floor, water-closets, &c., and good behaviour of all the workers, and other matters, appear to be framed with great care. The rule "Five minutes to be allowed for relaxation at twelve o'clock," dinner not being till two, is a small but not unimportant instance of consideration for workpeople.

9. Another rule directs that,—

> "For the purpose of admitting fresh air into the factory every man shall take his turn weekly at breakfast, dinner-hour, and night in opening the windows of the room in which he works," (under penalty of a penny for neglect.)

10. One of the rules relating to the boys is worth giving in full:—

> "*To be poor is no disgrace, but slovenliness is inexcusable.* It shall also be imperative on every spinner under the penalty of (a fine) to see that the boys employed by him have their hands and face washed and hair combed every morning before commencing work. *Health and enjoyment are promoted by cleanliness, whilst fever and disease are the offspring of uncleanliness.* The preservation of the health of all employed in the factory rendering it necessary that the above two regulations be strictly observed, no excuse will be accepted after a boy has been once challenged for neglect of them, but instant dismissal."

11. There are also regulations under the head of "Recreation" for the arrangement of games:—

> "The foot and putting balls with quoits being provided to promote the amusement and health of all employed in the factory," "it is hoped a spirit of mutual forbearance and love will exist amongst all, so that young and old may, if inclined, join in the games."

12. The appearance, manner, and answers of the boys seemed to show that the regulations for securing cleanliness, order, and education are not merely formally drawn up and given out, but acted on. Though the boys were apparently of a very poor class, they were neat, clean, and under good discipline. The proportion of boys who could read was far above what I remember ever to have noticed amongst an equal number of boys of the like class and age. Of 62 of the younger boys taken consecutively, 47 of whom are between the ages of 9 and 13, 50 said that they could read. A few of these were rather doubtful whether they could or not. One answered "a wee thing," another "a penny," *i.e.*, in the "penny" book. Of those, however, whom I selected to try, some could read fairly, and all showed some knowledge of it.

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13. Altogether the management of this manufactory is most satisfactory and encouraging, and I have thought it right to draw attention rather at length to such an instance.

14. *Mr. Richardson.*—We are the largest tobacco manufacturers in Edinburgh. Altogether there are, or were a short time since, about 25 tobacco manufacturers in Edinburgh and Leith, employing about 260 boys. Of these we employ 70, and three or four other manufacturers perhaps from 20 to 30 or so each, the remainder of the boys being in small places, several manufactories having perhaps six or eight boys. According to a careful list made out in 1853, there were about 38 tobacco manufacturers in various towns in the eastern part of Scotland, exclusive of the 25 in Edinburgh and Leith. These are most of them small, employing, perhaps, on the average from two to nine boys. At the same time there were in Glasgow about 28 tobacco manufacturers, and a few in Paisley and Greenock, and perhaps one or two other places in the west of Scotland. The numbers remain probably much about the same as then, though perhaps the work may have become rather more concentrated in the larger manufactories.

Our hours are from 7 a.m. till 6 p.m. in summer, and from 9 a.m. till 7 p.m. in winter; and on Saturdays only till 1 p.m. There is an hour and five minutes for dinner at 2 o'clock, and in summer the same length of time for breakfast at 9 in addition. The hours in other manufactories here are, so far as I know, much like ours. In country places the usual day is, I believe, about 10 hours' actual work, beginning an hour sooner than we do.

The necessary work can be got through in any manufactory by a regular stated hour if there is proper application. We scarcely ever make any overtime, or more than perhaps an hour at most. We think that we should not produce enough work by it, *i.e.* not procure an article in the same style, so that it is not to our interest to work overtime. The tobacco manufactured in Scotland is all of the same kind, viz., roll tobacco. I never heard of girls being employed in the trade in Scotland.

I am of opinion that the character and condition of the boys employed in the trade here has decidedly improved in the last 20 years. There is an evening school in Edinburgh for tobacco boys, which is supported entirely by manufacturers and others engaged in the trade and the boys' fees. These amounted last year to 22*l.* 15*s.* 1½*d.*, each boy being required to pay ½*d.* a week. It was thought better for them to have to pay something themselves. The school was established on its present basis in 1852, though it had existed in a less complete form since the year 1820. Its effects are decidedly good, but the great difficulty is in getting regular attendance, and this is chiefly owing to the indifference of the parents. There should be some regulation making attendance compulsory. With regard to the present inquiry, there is one point which it is of importance to note, viz., that in the tobacco trade here the increased demand has run to lead to the employment of more and younger boys in it than formerly.

THE EDINBURGH TOBACCO BOYS' SCHOOL.

15. The report of the "Edinburgh Tobacco Boys' School" for the year 1863–64, kindly furnished to me by Mr. Richardson, states that the institution

"During the last 12 years of its operation has conferred inestimable benefits upon many hundreds of industrious children. And besides this, it should be borne in mind that the higher branches of the trade are now principally recruited from the ranks of the boys, and therefore it is of the utmost importance that every available means should be used to improve their character and intelligence."

Also that in the then past year the prosperity of the school had been "progressive in respect of "numbers, organization, and results." It gives the average attendance in each month as 92, and as pretty uniform. It states that at the annual examination the whole of the senior division, which furnished towards two-thirds of the attendances,—

"Were found to be well acquainted with the geographical boundaries and divisions of our own country, and making fair progress in the simple rules of arithmetic."

And in reading and spelling the higher classes—

"As usual showed great proficiency, and those in the lower coming well forward, each in proportion to the regularity of his attendance."

The directors, "looking to all the circumstances of the case, do not see that a much greater measure "of prosperity is likely to be achieved." The report, speaking of the benefits of the school to the community at large as well as to the trade, adds—

"Indeed, we are proud to say that, to our knowledge, the Tobacco Boys' school is the only school in Edinburgh founded and supported by a trade."

MESSRS. S. MITCHELL AND SON'S, TOBACCO MANUFACTURERS, ST. ANDREW'S SQUARE, GLASGOW.

16. *Mr. S. Mitchell.*—We are the largest tobacco manufacturers in Glasgow. We employ nearly 100 boys under 18, 81 of them between the ages of 8 and 13, and about 40 men. By about 14 or 15 the boys get too big to be suitable for the boys' work, and most leave it by that age for other employments. The work will probably always continue to be done by young boys. Machinery cannot be used to any profit for spinning or pointing, which, with stripping the leaves, are the processes employed in making roll tobacco, the kind made in Scotland. Girls are not employed in the trade in Scotland, so far as I know. There is scarcely any place in the south or west of Scotland, except Glasgow, Paisley, and Greenock, in which tobacco is made.

Half time for the boys under 13 could not be carried out without some increase of expense. The wages, which are paid by the men, are so low that boys would not come at all for only half their present pay. The youngest, or wheel boys, get from 1*s.* 6*d.* to 1*s.* 8*d.* a week, the next class, or strippers, from 2*s.* to 2*s.* 6*d.*, and the pointers, or highest class, from 2*s.* 6*d.* to 3*s.* We could not carry out such an arrangement by ourselves, but if it were a general legal requirement for all manufacturers, I should not see the slightest objection to it at all. We should gladly submit to the increase of expense, so that it suited the boys.

There is nothing in the trade injurious to health, or in any way to be taken into account as regards the boys, except their tender age and their too long hours of work. Our hours are from 6.30 a.m. till 6 p.m., with two hours for meals, and these hours are rarely or never exceeded. The trade is regular, and the work could be kept within an uniform stated period without difficulty.

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For about two years a tobacco boys' evening school has been established in Glasgow by the trade, just of the same kind as that in Edinburgh. I and one or two other manufacturers were the chief promoters of it. I had tried for years before we could succeed in establishing it. It is successful and has already done good. The boys are expected to attend, and if they do not are reported to the foreman, but he cannot do much towards making them attend, if they do not wish it. One of the great obstacles is the unwillingness of Roman Catholic parents to let their children come to a general school.

The tobacco manufacture is one of considerable importance in Ireland. It is roll tobacco as it is here; there is scarcely any cut tobacco made in Scotland. The Irish home consumption very far exceeds the Scotch. The population is so much greater, and tobacco is sent largely from there to England. There are more large manufacturers in Ireland than here, some in Dublin, Belfast, Cork, Limerick, Dundalk, and others, I believe, of considerable size in smaller towns. I should say, however, that though there may be Irish manufactories turning out a greater quantity of tobacco than ours does, there is none which employs a greater number of hands. The rolls made there are all of one kind and much thicker than we make, so that less labour in proportion to the bulk is required. The same reasons that prevent the application of machinery here must hold good there also.

[The foreman stated that the school had done great good in improving and reforming the boys employed in the manufactory.]

Messrs. D. and J. M'Donald's, Tobacco Manufacturers, Trongate, Glasgow.

17. *Mr. D. M'Donald.*—Besides 10 men I employ about 30 boys, most of them between 10 and 12 years old. There are a few younger, perhaps by two or three years; the oldest is 14. Unfortunately, tobacco boys are of the very poorest class of boys who are at work at all, and very migratory, constantly changing from place to place. They change about more now than they did formerly, because there are more workplaces. They earn here from 1*s*. 3*d*. to 3*s*. a week, according to their work.

There is no occasion for irregular hours of work in this trade, and I do not allow it. The hours are from 6.30 a.m. till 6.30 p.m., with two hours for meals. The work could be done as well by two sets of boys as by one if they could be got to come.

[Two of the boys were 7 years old, one of them having come when only a fortnight over 7; the other, who had been there a few weeks, earned 1*s*. 1*d*. a week; a third, aged 9, said that he earned 1*s*. 6*d*. and always went to the night school.]

Messrs. J. Keppie and Co.'s, Tobacco and Snuff Manufacturers, Trongate, Glasgow.

18. *Mr. Keppie.*—We employ 28 men and 74 boys between the ages of 8 and 14. Our number is about the same through the year. The boys are the lowest of the low. They earn from 1*s*. 2*d*. to 3*s*. 8*d*. a week, some up to 4*s*. It is not customary to employ girls in the tobacco trade in Scotland, though I think that I have heard of one town where a few are so employed. Our foreman has two or three times talked of trying girls, as we are often scarce of boys. There must, I should say, be 500 tobacco boys employed in Glasgow, as I think that number could be turned out for a school trip. But there would be difficulties in the way of having girls with boys, as separate closets, &c. would be needed.

We make it compulsory on the boys to attend the night school. If they will not go we do not care to keep them. We have introduced a system of tickets, which the boys must bring here with them to show that they have been at the school regularly. But it requires a great deal of attention to get them to go. Boys often leave us sooner than go to school. It would be better if employers had power to force them to attend. It is a pity to see the boys growing up in ignorance. I believe that the school has done a lot of good. For instance, a boy 12 years old when first sent there could not read; now he can. He had been in a ward before. If we see a well-doing boy, we always take him out for a better place if we can.

The tobacco manufacture is carried on in many towns in Ireland. In some of the larger towns there are several manufactories, in some others one or two. There is probably no manufactory in Ireland in which there are as many boys as there are in ours. In Ireland the great majority of the boys are quite big, say from 15 to 18 years old; the rest are men. It is, however, many years since I was employed in the trade there. The general working hours there were then from 7 a.m. till 7 p.m.

The Glasgow Tobacco Boys' School.

19. The "Second Annual Report of the Glasgow Tobacco Boys' School," giving an account of the school for the year 1863, kindly furnished to me by Mr. Buchanan, a member of one of the firms of Glasgow tobacco manufacturers, is full of interest, and shows that the school has been most beneficial, having been "so successfully carried on, and with such marked improvement in the manners and "education of the boys." The following remarks, urged as a special reason for making "provision for "the education and moral training of the young" employed in the trade, are worth extracting:—

"While within the memory of almost every employer machinery has been constructed to lessen or supplant the work of children in other factories, mechanical invention has done absolutely nothing in this way for those employed in spinning tobacco. The peculiar description of the material operated upon renders the operative dependent upon the assistance of children, because he cannot procure by any other means such services as those performed by the fingers of boys. Thus, while he is indebted to their industry for the means of earning wages, the capitalist is also, from the intrinsic value of the raw material and the ease with which it may be pilfered, rendered dependent upon their honesty, and both are at one from regard to their pecuniary interests, although no higher motive existed, as to the necessity of elevating the moral and intellectual character of the children in their employment."

20. A later passage of the report is as follows:—

"We quote a brief practical report made by Mr. Gorrie (superintendent teacher), indicating the amount of good which education is silently producing amongst them (the boys), perhaps more decisively than any other test which could be applied:—

"'When we first broke ground in the old Vennel school two years ago, a very large number of boys chewed tobacco. It was no uncommon thing to find small quantities of tobacco, sometimes in the leaf and sometimes in a prepared state, in the possession of these boys. The first night or two the floor, on dismissal of the school, was literally one pool of tobacco juice. Now you will not find a spittle on the floor from one week's end to another. During last year

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only one boy was found in possession of tobacco which he could not account for in a satisfactory way. * * * *

"'It is still a matter of regret that the very class of boys who have most need of education are just those who are continually bolstering up excuses for irregular attendance, or as often for non-attendance altogether, although I do not believe the boys have any real objection to attend the school themselves; on the contrary, I know it for a fact, that some of our boys have come to school before going home, lest they should be prevented from coming by their parents. Alongside of these, however, it is very pleasing to see the interest that some parents take in their children. They call at the school now and again to ascertain the attendance of the boys—a method that I encourage as much as possible. By that means some of our most inveterate truants have been turned into the most regular in their attendance.

"'In instituting these schools, you inaugurated a new era in the history of the tobacco boys of Glasgow. You are now putting these boys in a fair way to rise from poverty to comparative affluence.'"

21. During the then past year (1863), according to the report, "the largest number of names upon "the roll at any period was 445, and the lowest number 326," and "the average was 250." The fluctuation is accounted for amongst other things by the boys being—

"Naturally fond of play in summer and of home in winter after late hours during brisk trade, when it has frequently been found that these hours unavoidably encroached upon those of the school" (which are from 7.15 to 9 p.m. every evening except Saturday and Sunday, J. E. W.) "A good many excuse themselves on the ground of attending other schools connected with Roman Catholic or other persuasions."

22. A falling off in attendance of upwards of 80, as compared with the previous year, is reported, but it had not—

"Arisen from want of boys, for so far as can be ascertained a larger number have been employed in tobacco works in Glasgow during 1863 than had ever been in any former year within the history of the trade."

This falling off is attributed "to a want of diligence on the part of the operatives" in using their influence to make the boys employed by them attend school regularly.

23. The report states that:—

"Scarcely any class of journeymen operatives has been so steadily employed and well paid as tobacco spinners have been during the past year, and it is indeed humiliating to have occasion to report that the children upon whom they are dependent are, generally speaking, not only ill-fed and ill-clad, but are also comparatively illiterate, while yet the means of instruction are placed within their reach."

24. At the annual meeting of subscribers held on the 29th of December 1863, the operative spinners unanimously recommended to the directors the appointment of a school inspector, who, in case of any failure in regular attendance, should—

"Ascertain, by visiting the homes of the boys and the shops in which they are employed, the reason of their absence. He should also visit the school as often as directed."

MESSRS. J. AND J. HARVEY'S, TOBACCO MANUFACTURERS, HANOVER SQUARE, NEWCASTLE-ON-TYNE.

Newcastle-on-Tyne.

25. *Messrs. Harvey.*—We dislike making overtime. The work does not go on so well without the supervision of the master, and the people do not work so fresh. At one time our hour for leaving off work was 7 p.m., but we found 6 better. Our hour for beginning is 7.30 a.m. Saturday is the same as other days here, indeed it is one of our most important days. The trade is regular and not one of season. Still we have to make overtime occasionally, say, till 11 p.m. perhaps, but we try to avoid having two nights late running; *e.g.*, if we are late on Wednesday, the hands leave at the regular time on Thursday, and stay late again, if necessary, on Friday. But it is not often that we are late, not more than an average of one night in a fortnight taking the year through. But it would be very inconvenient if we were prevented from working overtime occasionally. We do not think the evil one of sufficient magnitude to require any legislative interference, and such regulations might cause considerable loss. Our customers might go to other manufacturers if we could not finish an order within the time required; or it might tend to force the sending off of goods in a hurry before they were properly ready, which would injure the quality. Tobacco, too, pays a very high duty, and the manufacture should not be hampered by further restrictions. If we were under a Factory Act it might necessitate our employing on an occasion, *e.g.* if we found our stock getting low, more hands than we want to employ regularly.

The reason that we cannot keep a sufficient stock to ensure avoiding overtime is that it does not do to prepare the tobacco long before it is wanted, tobacco when it is cut being a perishable article. As a rule, what is made one day we send out the next if possible; it is not dry enough to send out on the same day. Some, however, may be kept three or four days. Roll tobacco when pressed will keep for months, so that the spinning department might be capable of regularity. It is, however, chiefly in this that we have to keep the hands late. In making cut tobacco steam does most of the work, so that by merely putting on another machine or so we could increase the amount produced immensely.

We have paid great attention to the health and comfort of the workpeople, and gave the architect of our manufactory particular instructions to give plenty of space, air, and light. We also provide a medical man for our people. All the hands are paid directly by us. It is a bad look-out for the children when they are paid by the men; we do not allow it.

We established an evening school for the girls under one of our workwomen. They attended through a winter, but fell off towards summer, and it was found too up-hill work to keep it up.

26. *Elizabeth Ann Addis*, age 12.—Wheel girl. Come to work at 7.30 a.m.; cannot tell what time we leave, it may be 5.30, 6.30, or up to 10.30 p.m. Have not been so late as 10.30 very often, and never later. Stayed last night till 10.30, and one night last week till 10.20. Sometimes we stay late just through a week. All go home an hour for dinner; when we stay late we take tea here. Get 1*s*. 9*d*. a week, and 2*s*. ½*d*. with overtime.

Am sickly. Was off this morning because my head was bad. Took sick last night when I went home, and was sick through the night. Have not very often been sickly before, but when I first came here,

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two months ago, I was dizzy like. It is not often I can take my dinner, but I can take it as well as I did before I worked here.

Have been at school a little, but since I have been here I have lost most on it. Go to school at night sometimes.

[Looks constitutionally weak and sickly.]

27. *Elizabeth Charles*, age 10.—Wheel girl. Left work last night at 11; we begin in a morning at 7.30. Think we shall be late three nights this week.

28. *Margaret Howell*, age 12.—Pointer. When we make overtime, stay till 10.30 or 9 at night. Get 2*s*. 3*d*. a week. Can read, and can write a little.

MR. DICKINSON'S, TOBACCO MANUFACTURER, BIGG MARKET, NEWCASTLE-ON-TYNE.

29. *Mr. Robert Stafford*, manager.—Towards 70 persons are employed here, three-fourths of them females from 10 years old upwards. The youngest turn wheels, the next point, the elder girls strip. They get 2*s*. 6*d*. a week at first, and gradually rise. The tobacco is of both kinds, roll and cut. Cigars are little, if at all, made in the north. The hours are from 9 till 6 daily, including Saturdays; till six or seven years ago they were from 8 till 7. All go home for an hour to dinner.

The hours were shortened thus to enable us to get away ourselves, and it was expected that if shorter hours were given the workpeople would exert themselves more, and it was put to them in that way. We have found by experience that they do as much now with the shorter hours as they did with the longer. When people have been long at work they cannot go on with any energy. At first the shorter hours were tried for a time as an experiment only, and were finally adopted as being found to answer. Overtime is avoided, and what work is wanted can be got through in the regular time. There are now more space, more hands, and better machinery. More hands are not engaged unless the increase of business is likely to be permanent.

The factory is a large room, I should say 100 feet long, and open to the roof and lofty, and being newly built is fitted with every convenience. It is warmed by pipes in winter, and is cool in summer, the roof being in ridges glazed only on the north side. I consider that the people have good health. The girls are not away more than may be reasonably expected in any work.

30. *Elizabeth Hord*, age 12.—Two years here. Was first a wheel girl, then pointer, and am now a stripper, and get 3*s*. 6*d*. a week. Hours (*as above*).

Am a very poor reader, but know all the letters. Very seldom went to day school. Think I will go to the Catholic night school if mother will let me.

[Very healthy looking.]

Sheffield.

MR. LAW'S, TOBACCO MANUFACTURER, BRIDGE STREET, SHEFFIELD.

31. *Mr. Law*.—The youngest children are employed by the men. There should, I think, be a law that they should not work so young, and this inquiry into the matter is very proper. It is the men's interest to get as cheap labour as they can, but if it were we and not they who found the labour, they would complain of having such young children.

32. *James Fischer* (adult).—We work from 8 a.m. till 6 p.m., never more, often less. None are allowed to stay here at dinner hour. There are 12 boys and girls in this room, and five downstairs. The youngest is eight years old. The children get from 2*s*. 6*d*. to 3*s*. 6*d*. a weak, which is better pay than they do in Scotland. Boys over 14 are not allowed to work; they are too big and would perhaps take the tobacco.

Spinners usually have a separate room. Here the steam from drying the cut tobacco comes up to us. The steam affects the lungs and makes you hoast (hoarse). The work makes some children very sick, their first day quite sick. When I first went I was sick.

I have wrought in the largest tobacco manufactory in Dublin. There were 27 hands there in the spinning. We worked from 7 a.m. till 7 p.m., or dark. I wrought also in the largest Scotch manufactory, which is at Glasgow. We were only allowed to use a light short strap of chamois leather for the boys. Men had used bigger straps too much, and been had up and fined.

33. *Edward Hay*, age 13.—Work at steaming the tobacco and spread it out over the steam. It made me sick at first, but does not now. Get 4*s*. a week. Cannot read very well.

34. *Samuel Atkinson*, age 8.—Just come. Turn a wheel. Work from 8 till 6. Could read when I was at school, but can't now. Don't know what 8 and 2 make.

35. *James Newton* (adult).—From 8 till 6 are the hours in tobacco manufactories throughout the town. At odd times some work a couple of hours later. Believe that in the trade, generally, the hours are shorter than in other trades.

36. The above was named to me as probably the largest tobacco manufactory in Sheffield. I visited another (Ingleson's) and found the hours the same. But very few persons are employed at it. Of the only two girls at work at the time of my visit, one, aged 13, had never been to week-day school; the other, aged 10, could not read; she answered that twice 7 was 17, then that it was 16.

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REPORT upon the TOBACCO MANUFACTURE in Lancashire, by Mr. H. W. LORD.

TO HER MAJESTY'S COMMISSIONERS.

GENTLEMEN,

Age.

1. I visited several manufactories of cigars and of tobacco both in Liverpool and in Manchester. In cigar making few children are ever employed, but in preparing tobacco of the kind known as pigtail, many are employed very young; probably the majority begin before they are 9. I found one boy, who was only 7, turning the wheel for twisting. In order to do this he had to sit on the table on which the roll was being laid, as otherwise he could not reach the wheel.

Sex.

2. Both boys and girls are employed in each of these manufactures, and in similar occupations; in one tobacco manufactory in Liverpool nearly one-third—31 in 103—were females. So large a proportion is not usually found in Manchester; at the cigar manufactories of the former town, most, and in some cases all but two or three, are of that sex.

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Number.

3. The relative number of children and young persons in tobacco manufactories is considerable. Returns from two such works show that out of a total of 145 there were 38 under 13, and 35 between that age and 18; the number under 18 exceeding by one that of the adults. Where men are employed to make cigars, a few children assist, and there are some apprentices under 18, but their number is not large; in the Liverpool houses, where female labour has been very generally adopted for this purpose, most are young women, and very many under 18, though few are under 13.

Hiring and wages.

4. Cigar makers are apprenticed to their employers at 14 for seven years; this is the case with both sexes generally speaking. Those who assist in making pigtail and in the other departments are paid a weekly wage, sometimes by the men who twist, and sometimes by the employer.

5. The youngest, who strip the leaf or lay the "wrappers" for the pigtail, earn 2*s.* or 2*s.* 6*d.* a week; the older ones at the same employment earn 4*s.*, and even 6*s.* Cigar makers are paid 2*s.* a week during the first year, while they are learners, and afterwards are paid so much a hundred for what they make, 6*d.* for the second year, 7*d.* for the third, and so on; some in their third year, or at 17, realize 8*s.* and 10*s.* a week, while others, who are slow, careless, or idle, may not earn more than 3*s.* Several girls in the sixth year of their apprenticeship had earned 17*s.*, and one 1*l.*, in the week before I visited the manufactory in which they were employed.

State of places of work.

6. In no trade have I seen so wide a difference between the various workshops as in this. One, the largest of its kind, was an unique specimen of handsome architecture applied to sanitary purposes with good results. Others, small places for the most part, and furnishing no evidence worth preserving, were dirty and unwholesome. Even in shops, where a hundred hands and more are frequently employed, there is in this respect need of much greater attention and care than has hitherto been bestowed on matters of ventilation and lighting; the gas jets being in many cases placed immediately in front of every two or three persons on a level with their heads, or raised but little above them. This subject is so intimately connected with that of the effect of the employment on the health of the workpeople, that I will reserve any further remarks for that head.

Nature of employment.

7. Stripping and sorting leaves for cigar makers and others,—employments in which children and young persons of both sexes are engaged,—need no special description. Cigar makers sit in rows at long tables, which are divided by partitions, so that each worker is independent of his or her neighbour. The cigars are all rolled by hand, a certain quantity of leaves of the various qualities, which go to the composing of each particular cigar, being weighed out to each work person, who returns them in the form of cigars to be weighed a second time. Pigtail is rolled on long narrow tables, at one end of which is a small wheel. This is turned by a little boy, where steam power is not used for that purpose. Other boys follow the man down the table, laying the leaf on it for him to twist. The whole process is very similar to that of ropemaking. The tobacco-cutting machines are sometimes "tented" by the older lads, but in most cases by adults.

Hours of work.

8. Overtime is not usual in the tobacco manufactories, even the ordinary working day is shorter by one hour than in most trades, being from 7 a.m. to 6 p.m., or from 8 a.m. to 7 p.m. In some of the Liverpool cigar manufactories, however, the usual hours, 8 a.m. to 7 p.m., are not unfrequently exceeded by the space of two hours; one young girl told me she had worked until 9 for every night for three weeks; and the foreman stated that in 1861 they had usually worked on till 9 p.m. from August to December. (No. 4.) The extent of overtime was very variable from year to year. At the works, where this had taken place, no tea time was allowed, and several of the girls told me that they were "very tired when 9 o'clock came." (No. 6.)

Meal-hours.

9. An hour is universally allowed for dinner. I have above noticed the case of girls working from 2 p.m. to 9 for weeks, and sometimes months together, without being allowed any tea. In some works the boys are not suffered to leave for the dinner hour (No. 7.), lest they should have two opportunities in the day, instead of only one, for secreting tobacco about them, a practice apparently almost characteristic of the trade, and one to which I shall allude under another head.

Influence of employment on physical condition.

10. Under favourable conditions as to hours and place of work, the employment is a healthy one. Dr. Stooks and Dr. Gee, of Liverpool, the former of whom had at one time attended professionally most of the cases of illness in one cigar factory, were not aware of any special effect of the work on the health of the operatives. It was stated that at the time of the great cholera all who were engaged in the manufacture of tobacco and cigars were singularly exempt from attacks. (Nos. 4, 10.) I have, however, obtained some very interesting evidence relating to the extreme importance of good ventilation in the workplace, or at all events in those, where young women are employed in this business. I refer to the evidence of Mr. Cope and his foreman (Nos. 1, 2), who state, that before certain alterations in their premises had secured sufficient circulation of pure air, "not a day passed without some one or other of them fainting "or going into fits; many were compelled to give the trade up altogether," so that Mr. Cope "began "almost to despair of making women useful;" and his foreman "got quite nervous and used to burn "brown paper and do other things to fumigate and purify the place," and thought "there must be "something in the nature of women that made them unfit for the work." This state of things had, however, been so completely got rid of, that one of the young women in the employ of the Messrs. Cope, who had, she said, been always ill when she had worked there before, told me that she had not even felt faint or sick at her work for the last 18 months; and the testimony of others at the same place fully confirmed this statement. (No. 3.) By some indeed (No. 4) these effects have been attributed to well-known natural causes which periodically affect the female system, but on my mentioning this to Mr. Cope's foreman, I found that he had himself at one time been of that opinion, but his subsequent experience of six years had convinced him that it was erroneous.

Moral condition.

11. Mr. Cope informed me that the girls in his employ are "generally well behaved and good. Not "more than three of ours have ever gone on the town from our works." (No. 1.) Mr. Steel, however, gives a very different account of their conduct at so recent a date as 1854-5, when they (the female apprentices) "used to set all rules and order at defiance;" "they would curse and swear, and dance "about the room, refusing to work." Even now, though orderly enough "if they are blamed or kept "in at all by their parents, they will leave home and go, three or four of them together—young girls of "16 and 18—and take lodgings with some old woman to keep house for them." (No. 5.) So Mr. Steel's foreman: "None that I know of ever go to night school; they prefer walking about the streets "and going to places of amusement, to improving themselves." In all this perhaps there is nothing

more than the necessary result of their love of gaiety, which is natural, and of the early independence, which, though in a sense unnatural, is the obvious and usual consequence of ability to earn enough to be self-supporting.

12. The system of almost wholesale pilfering, with which both the girls in cigar, and the boys in tobacco, manufactories are charged, is more serious. Mr. Fletcher is afraid to let the boys "go off the "premises to dinner, lest they should secrete tobacco." (No. 7.) Mr. Steel "loses several hundred "pounds' worth every year, but can never detect any one." According to his account the conspiracy to defraud their employer is so general among them as to lead to the inference that their moral sense does not recognize the act as a crime; for before the female searcher has time to do more than stop a suspected person, as they all pass out, "several other girls are round them, and a packet of tobacco or "cigars is found on the floor beneath their dresses, but no one can say from whom it fell." (No. 5.) Even Mr. Cope, who has checked, if not put an end to, this practice in his works, has done so, not by means of a higher tone among his hands, but merely by operating upon their fear of detection through a scheme more successful than that of searching the person, namely, placing round the workplace a gallery with windows, which their apprehension furnishes with eyes that are always watching them. (No. 1.)

13. The boys in the Liverpool tobacco manufactories are said to be "most of them totally "uneducated and very mischievous." Of the truth of the former part of this character, I find ample confirmation in my notes: at one of the best of them, "not half the boys could read at all," (No. 8,) by which I mean that they did not even know their letters. The girls were for the most part better educated; partly because they do not begin so young at the work: in Manchester, however, the boys could, most of them, read a little.

14. In illustration of the utter indifference of parents to the welfare of their children, when any trouble to themselves is involved in seeking it, the account given by Mr. Steel of the failure of his attempt to introduce a scheme of wage tickets, with the view of affording the parent ample and gratuitous information as to the earnings and conduct of his child, is well worthy of your notice. (No. 5.)

I am, &c.
Henry W. Lord.

EVIDENCE.

LIVERPOOL.

At Messrs. R. Cope, Brothers, Lord Nelson Street.

1. *Mr. Cope.*—I believe we have the most extensive premises, and employ the most persons of any cigar manufacturers in Liverpool. 385 persons are employed here; 5 girls are under 13; 10 boys and 80 girls between 13 and 18; 90 males and 200 females over 18.

The reason of our having so many girls is simply that our men had a dispute with us about the number of apprentices, and we did not choose to be dictated to. Now, the only men we employ are the few who did not turn out when the rest did. So far as the work goes, girls, after some few years' training, do it as well as men. Each one goes through the whole process for herself, beginning with the sorting and removing the stalk, and performs all the various operations, without any helper, up to the making of the cigar. If we are pressed for time, occasionally, we have helpers to arrange the leaf for the maker; they can get through many more in the day with that assistance, but it is not often necessary.

There are some disadvantages in employing girls: they are more difficult to manage; it is entirely a question of coaxing with them; if they are blamed or put under strict orders, they prefer to go away; they do not fear the loss of work, for all look forward to marrying.

They are generally well-behaved, good girls. Not more than three of ours have ever gone on the town from our works; indeed, if a bad girl comes in among them, she is generally pointed out by them. The fact is that girls do not ever go to the bad from trades at which they can earn enough money to keep themselves.

Their occupation is not necessarily unhealthy—far from it—but the absence of all effectual ventilation in many workrooms frequently makes it so. In our own case, before we had the whole present width of this building, there were windows only along one side, and a blank wall opposite. At that time, as you hear from our foreman (see No. 2, inf.) not a day passed without some one or other of them fainting or going into fits; many were compelled to give up the trade altogether, and I began almost to despair of making women useful; but we broke the wall down, and took in the whole space through to the windows on the other side, and left the centre of the building open from the basement to the roof; the result has been that for the last six years, that is, since this alteration, not one case of the kind has occurred. It used to be among the younger ones, and those unaccustomed to the work, more especially, that this took place, but with many it lasted for years.

I am sure it would be a good thing to insist that there should be so many cubic feet of air allowed for every person employed, where several work together. It is even to the interest of the employers, if they would but see it; for when the workpeople are in a healthy atmosphere, they can get through much more in the same time. It is in places where they are limited for want of room, and crowded together, that overtime becomes necessary.

We generally bind the cigar makers as apprentices for seven years from 14 years of age. Those whom we have at that branch of the business who are younger, have been let in either by a kind of exceptional favouritism, or through misrepresentation. They are paid 1*s.* a week at first, and after that allowed to receive two-thirds of the journey wage; an industrious girl will earn in her third year about 8*s.* a week. We find those do best whose parents require them to bring home some stated sum, and let them keep the balance: it leaves them no heart for work, if they give all up. Most have been to a school of some kind before they came here. The majority can read more or less; still, if you look at our indenture book you will see how very many only make their mark. I think that in many of the schools they cannot be taught properly: you hear what Miss Walbrake, our forewoman, says—that when she used to superintend our night school for the girls a great number could not read, though they had been to school before. I believe it would be well, if we were compelled to employ none under 14, and then only such as could read and write.

At one time we suffered from continual pilferings of tobacco, amounting in the year to a large amount. We used then to have the workpeople occasionally searched as they left the building: that, I think, had a debasing effect, and did not even answer our end. We have now an observatory or gallery with small windows built round the upper part of the room; and

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the apprehension of being unconsciously watched seems to have had the desired result, for our losses since that have been quite trifling.

We have some girls, you see, making up packets, cutting, and so on. If any of those upstairs are particularly tidy and respectable girls, we promote them to that. Two or three young ones are turning the wheel or laying the leaves for spinning pigtail. There has been no change in that kind of work for the last 100 years. Machinery is not used, merely because the attention of scientific mechanics has not been directed as yet to the subject. Machinery is used by us for cutting, but no young ones work there, nor in the snuff-making nor steaming department.

About 50 of our girls dine here instead of going home. They have a room for the purpose, with a fire and stove to warm their food. In winter we give them soup at a 1*d.* a pint; at that rate it is just self-supporting. The work-rooms are warmed by steam pipes in cold weather. They have privies and wash-basins on the premises.

2. *Mr. Robinson*, foreman.—No doubt many of our girls are very little educated, still the signing their indentures by mark is not a fair test; they are very nervous, when they are brought for the first time to engage themselves to a business, and an employer, of whom they know nothing, and will be sure to make their mark, unless they are confident of writing well.

I am quite convinced in my own mind of the truth of the remarks I made in Mr. Cope's presence about the improvement in the health of our people ever since we enlarged the premises and had a good system of ventilation. I used myself to think that the monthly periods had a good deal to do with it, and that there must be something in the nature of women that made them unfit for the work. I got quite nervous, and used to burn brown paper and do other things to fumigate and purify the place; but it is proved by the result to be nothing more than want of a proper quantity of pure air. You shall ask the girls and women themselves, both some who worked here before the alteration, and some who have been at other places, and hear what they say.

An additional source of ill health among cigar makers is the working by gas-light in crowded and insufficiently ventilated places. We have the "sun burner" here, you see, the jet of which is more than 20 feet above their heads, and beyond that is the long pipe at the end of which it hangs, and which acts itself as a ventilator. In many shops the two rows of tables are, for want of space, set back to back, the workpeople facing one another, and from the centre of each four a gas jet rises through the table to a height level or a little above their heads. That is very bad.

The girls certainly do look cleaner and fresher with us than in most cigar places. I don't know that we have the pick of them at all. So far as their dress is concerned, that is merely the effect of a good example; we insisted on their being decently dressed at first, and they are all ready to follow now.

As to overtime, you may depend on it that nearly all of it is caused by want of space, as you say, rather than by want of time. You can't have more than a certain number in one place; and if you are full, and have more work than your hands can get through in the day, they must work longer; that is all.

> [3. The evidence of this witness was confirmed by several women and girls to whom I spoke according to his suggestion; one told me that she had always been ill where she had worked before, but that it was now 18 months since she had felt faint and sick at work.—H.W.L.]

AT MR. STEEL'S, DUKE STREET.

4. *Mackay*, foreman.—There are 90 or 100 girls and young women here in this room now; when we are full we have about 120. There are no males besides myself and a lad. Very few of the girls are under 14. At that age we apprentice them for seven years.

Their hours are from 8 a.m. to 7 p.m., with one hour for dinner at 1 p.m. At that hour they leave on Saturdays. Those hours are occasionally exceeded, but it is difficult to give an average of the number of times in the year at which we work on after 7. We never go on after 9. That girl, who told you she had been working till 9 p.m. three months ago for three weeks, very likely spoke the truth. In 1861 we worked as late as that from August to December; in other years we may not work overtime at all. They are paid by the piece, and therefore are very ready for a little overtime. They are not allowed any time for tea when they stay till 9 p.m.

We give the learners about 2*s.* a week at the first; after the first year they are paid by the hundred; in the second year they have 6*d.* for every 100, and rise 1*d.* a 100 in each succeeding year of their apprenticeship. Of course their earnings vary with their skill and their industry. Here you see those in their third year earned in this week, some 3*s.*, some 8*s.*, and even 10*s.* In the sixth year some of them earned 17*s.*, and even 1*l.* a week.

They are below the class of dressmakers. Their parents are chiefly poor people, labourers and the like, to whom their earnings are very useful. There is not much education among them. One-half of those here perhaps are able to read; certainly not one-half can write. None, that I know of, ever go to night school; they prefer walking about the streets, and going to places of amusement, to improving themselves.

We do not allow singing or talking; they are fined if they do so. Their health is generally good; at first they may be sickish for a day or two, but it soon goes off. Indeed the trade is noted for being free from the plague and the cholera, when others in the town are attacked. The girls have, some of them, fainting or hysterical fits now and then; I think they are in connexion with their monthly periods, and not with any effect of the tobacco. This room is close at times, it is badly contrived for such purposes; there are windows in the sloping roof, they do not open, but are only for light.* Indeed, on a hot summer day it is boiling nearly.

5. *Mr. Steel.*—What my foreman has told you is generally correct. I was not aware that they had no tea, when they stopped till 9 p.m. The room in which they worked was, however, built for the purpose of being used as a cigar manufactory, for when I took a new lease, the landlord agreed to build all over what was then the yard; the floor of the room being raised, as you see, above the level. He should have pointed out to you that the shutters in the vertical part of the roof open, though the windows do not; the door at the further end of the room opens also to the street at the back: it is their own fault if they have not air enough. But they complain of cold and draught, and put things over their heads, if the windows are open for ten minutes. They are a singularly careless, unreasoning set. I have talked time after time to them about the propriety of putting by a little of their earnings to buy a pair of boots or an umbrella. There is scarcely an umbrella among them, and they come in to work in the morning or from dinner on a rainy day dripping wet sometimes, and so will sit and work. It is that, and not anything in the work-place, or the nature of the work, that is likely to make them ill. I started a savings' bank for the express purpose of helping them to put by a few pence a week to buy some useful article of clothing or the like,—got a ledger, and opened a regular account; but I never had more than 10 or 12 of them, and they never left their money

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* See evidence of next witness.

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for more than a few weeks; but they preferred to spend their earnings in ribbons and ear-rings and worthless trinkets, or in going to places of amusement where they had better not be.

For one or two winters I used to let them have woollen polka jackets to work in, so as to be warm; but so many in a few days disappeared into the pawn shops, that I shall not repeat that.

We have a system of fines for being late and for misbehaviour; *2d.* is the usual sum; these accumulate, and are divided at the end of each month among those who have not been fined. Last month the fines amounted to *3l.* 16*s.*, and were divided among 20: eight of those on weekly wage received 2*s.* 3*d.*, and twelve of the piece-workers 4*s.* 10*d.* each.

We suffer very much from robbery. We lose several hundred pounds worth every year, but can never detect any one. We have a female searcher, who now and then stops one, as they pass out; but before there is time to do more, several other girls are round them, and a packet of tobacco or cigars is found on the floor beneath their dresses; but no one can say from whom it fell.

I was the first to introduce the labour of females in cigar making. I had a great deal of trouble with them. First, I had all the pains and cost of teaching them; that was a matter, in waste and loss, and in payment of teachers, of some hundreds of pounds from first to last; and then, as soon as they became proficient and at all useful, other employers tempted them away with higher wages. Since that I have had them bound by formal indentures. For some time we had continual disputes with the apprentices. They used to set all rules and order at defiance. They would curse and swear, and dance about the room refusing to work. I had to take several before the magistrates; they supported me in every case, but I pressed only for a conviction in one. I had the reports of several cases, both of my own and of others in the trade, printed in large type and hung up on a board in the work-room as a caution. This was about 1854–5. I began to take females, I think, in 1850. We have no trouble of that kind with them now; they are orderly enough.

When they are out of their time, if they like to stay with me, they do so, on the terms of giving three months' notice. I have not raised my prices to meet the offers of those who try to outbid me, and in most cases, I am glad to say, they have stayed with me for 1*s.* a 100, though they could get 14*d.* a 100 elsewhere. That would be better while it lasted, but mine is more regular; they have enough sense to see that; though when I urge them to save something, by telling them that they must not count on having no slack time with me, because they have not yet had any, they don't pay any regard to me.

Their faults mainly spring from being badly brought up; they are so independent, that if they are blamed or kept in at all by their parents, they will leave them, and go, three or four of them together—young girls of 16 and 18—and take lodgings with some old woman to keep house for them. Even now with us, when they are nearly out of their time, they won't suffer our foreman to speak sharply to them or to find fault.

Some time ago the parents used to be continually coming to me complaining, either that we kept the girls so late or paid them so little. I used to turn to our books, and show them that on the nights they said they had been at work, they had left at 7 or 8 o'clock, instead of 12 or 1 a.m., and that, instead of receiving only 3*s.* a week, they were taking 6*s.* or 8*s.*; or else that they had only been working for perhaps half the week, and absent the other half, or fined for being repeatedly late, and for other misconduct. At last I thought I had hit on a perfect plan, and sent circulars to all the parents to tell them that I should always give each girl a wages' ticket every Friday night, and I asked them to be careful to ask to see it regularly. The ticket stated on one side the number of days at work, wages earned, fines and premiums, and on the reverse the time of leaving for every day in the week, with the amount of overtime. Our clerk used to be employed the whole of Friday in drawing up these tickets. I read a paper on the system at the Social Science Meeting here, and several manufacturers told me that they were much pleased with the idea, as it was just what they had long wanted.

The whole thing was an utter failure. Not one parent in 20 ever took the trouble to ask for the tickets at all—certainly not to insist on seeing them—but came and pestered me as much as ever; and those that did insist often had not the sense to detect the most bungling erasure of the figures with which the delinquents screened themselves. So I gave it up.

> [6. Of seven or eight girls whom I examined here, I found only one who did not know her letters. The youngest I saw was about 12 years of age. Some told me that they were very tired when 9 o'clock came, but did not mind the sitting for the ordinary day's work. One, however, of about 25, whose duty it was to weigh the cigars, told me that she had herself been obliged to give up making cigars, because the sitting so long at the table gave her a pain in her side. Others, she said, had suffered more or less in the same way, and most were sick at first beginning; still she did not think the business unhealthy. The area of the room was 30 feet wide by 63 feet long; it was open to the rafters, the height of the side walls being about 11 feet. The roof sprung at an angle of about 30°, and within about 2 feet of the centre rose straight for a height of apparently 4 feet. Along the whole length of this vertical portion of the roof, and on both sides, were wooden shutters, which turned lengthwise on their centre. A door at the further end of the room opened above the street.—H.W.L.]

AT MESSRS. FLETCHER & CO., FLEET STREET.

7. *Mr. Fletcher*, jun.—We work regularly from 7 a.m. to 6 p.m., with one hour for dinner, and have no work after 6 p.m. We have 22 boys under 13; two of them are under 11. Most of them turn the wheel or spread the leaf for the men who twist pigtail. We often wish we had none under 13; they are most of them totally uneducated and very mischievous; we are afraid to let them go off the premises for dinner, lest they should secrete tobacco. The girls sort and strip the leaf; of them we have none under 13, nine under 18; there are 23 lads between 13 and 18; 22 female and 27 male adults. All have very good health.

> [8. One of the girls who had been for some time stripping the leaf, told me that she felt sick for the first day or two, but since that she had been better than she had ever been before. Not half the boys could read at all.—H.W.L.]

MANCHESTER.

9. MR. ROBINSON, WITHY GROVE.

Manchester.

We have no apprentices, but in that respect we are an exception to the general rule among cigar makers. In Liverpool they employ girls, but we do not. The lads we have seldom begin till they are 12 years old; there are one or two, however, who were younger than that. The little boy who told you that he was

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9 years old last July, and had been here a twelvemonth, is going to be sent back to his mother to-night; he is too young, even now, and ought to be at school.

We don't like to engage any, unless they can read and write, and we make their parents promise to send them to night school. They all work the same hours, 8 a.m. to 7 p.m. The youngest merely pick the dirt out, or strip the leaves from the stalks; they get 2*s.* or 2*s.* 6*d.* a week to begin with, and rise by degrees up to 5*s.* and 6*s.*; in the cigar department they are all engaged in preparing the stuff for the men who make the cigar.

In the tobacco department they assist the men either rolling or cutting; there are two men, one who cuts with a machine, something like a hay-cutter, the tobacco for smoking in pipes; the other stoves. There are seven or eight boys helping them or rolling; they get from 2*s.* 3*d.* to 6*s.*; some merely turn the wheel on which the roll is coiled; the older ones make the roll. There are two girls sorting leaves, they also have the liquoring to do, but goes on only for half an hour at the end of the day, and is done with a watering can. I don't think that is likely to produce the mess on the floor which you say is described to be characteristic of the trade 20 years ago. I often tell my men that I know of several manufactories where their floors are much cleaner than ours; but you see for yourself how little "mess" there is. The adulteration, so called, is with molasses and chicory. At one time an increase of 10 per cent. in the dry leaf was allowed; that is illegal now. There was more mess then. The floor of this cellar is asphalt, and there are vaults beneath.

MESSRS. SMITH AND WILLIAMS, SWAN STREET.

10. *Mr. Williams.*—We have 16 boys under 13, the youngest is only 7, he turns the wheel for his father, who brings him; there are several only a little over 9; it is very light work; they have either to sit and turn the wheel for twisting, or to stand at a table and lay wrappers for the man who makes the twist. There are three lads between 13 and 18, and 11 men; the only females are two grown women, who open the leaf for cutting; it is cut by machines; the older lads tent them.

Our hours are from 8 a.m. to 7 p.m. with an hour for dinner and half an hour for tea. We never have any need to work overtime, and never do. The work is very healthy; in the great cholera time there was not one case in any tobacco manufactory; we have nothing to do with snuff making, that is not made in Manchester, but a good deal of tobacco is cut and rolled here for smoking; the only adulteration is a little water and oil; none of that mess there used to be. The men generally bring their children; most of ours have done so; the boys earn from 2*s.* 9*d.* to 4*s.* at laying wrappers and similar work; the men get about 30*s.* in the week; they are paid by the piece; we pay the boys too.

[11. All the boys here could read; even the little one of 7 could spell short words out: this struck me as being a singularly bad case; for he had a brother of 9 years old working at the same place, and the father was earning 30*s.* a week there. The boy sat almost on the table, turning a small light disc of wood, which moved easily to his hand as he pulled it, not with a handle, but from the top; of course he did not, with his father standing by, admit that he was ever tired.—H.W.L.]

The MANUFACTURE of UMBRELLA and PARASOL HANDLES in the Neighbourhood of STROUD.

TO HER MAJESTY'S COMMISSIONERS.

Manufacture of Umbrella and Parasol Handles in Stroud.

Mr. F. D. Longe.

I.

GENTLEMEN,

1. The manufacture of sticks or handles for umbrellas and parasols and walking sticks has for some years been carried on in the neighbourhood of Stroud. Very young children, both girls and boys, are employed in this trade. The manufacture of these articles in great quantities is confined to this locality.

Number and ages of children and young persons.

2. There are now about five or six employers engaged in this trade. In the largest works of this kind there were about 250 hands employed at the time of my visit; of this number about 125 were girls and boys under the age of 18. I found that out of 14 children whom I examined, one was under 7 years of age, three had begun to work between 7 and 8, six between 8 and 9, and three between 9 and 10 years of age.

Employment of children and young persons.

3. The work in which the hands engaged in this manufacture are employed may be divided into three departments:—

(1.) Cutting and shaping the sticks, which are for the most part made of beechwood or ash. In this work no children are employed. It is ordinary carpenters' or turners' work, done by men and a few youths.

(2.) Cutting and turning the bone tips and handles. This is only done in two of these manufactories. Very young boys are employed in cutting bone with circular saws, and in drilling bone.

(3.) Polishing, varnishing, and drying the sticks. In this employment the women and younger children are engaged.

Bone cutting.

4. The rooms I visited in which the bone cutting was going on were low and badly ventilated. The atmosphere was loaded with bone dust. The little boys employed at the circular saws are constantly cutting their fingers. One little boy between 12 and 13 years of age had been working at the circular saw from 7 a.m. to 8 p.m. (meal times excluded) for one or two weeks together. (Evid. 5, 2, 17.)

Polishing and varnishing.

5. No machinery is employed in polishing and varnishing. The elder girls and women are principally engaged in varnishing. The youngest children place the sticks round a stove in the middle of the room to be dried. White and red lead is used to give a smooth surface and body to the varnish. The children have suffered from its unwholesome properties, and it seems that the employers are endeavouring to dispense with it as much as possible. (Evid. 1, 10.) The varnish used consists of naphtha, methylated spirit, and shellac. The rooms in which the varnishing is carried on are, in the case of the largest manufactory, very low and badly ventilated.

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I.

Hours of work.

6. The regular hours of work in most of these shops are from 7 a.m. to 6 p.m., overtime to 8 p.m. is, however, very common; one boy under 11 had often worked three nights in a week to 8 (Evid. 8); a girl of the same age, had sometimes worked a whole week to 8. (Evid. 10, 5, 6.) On Saturdays work ceases at 3.30 or 4 p.m.

Meal-times.

7. When the work does not begin before 7 o'clock, no time is allowed for breakfast. The dinner hour seems to be regularly observed, when the hands are employed on day wages. The machinery is stopped at dinner time.

Wages.

8. The children are all hired by the master. The average wages of the younger children are 1*s.* 6*d.* per week. (Evid. 1.) Some girls of 12 years of age only receive 1*s.* a week. The wages of the half-timers in the neighbouring silk mills are about the same. (Evid. 1.) In one manufactory I found that the children were paid according to their work. One girl of 12 years of age, employed in smoothing the handles of the sticks, was paid at the rate of 1*d.* per gross; her weekly earnings were about 3*s.* or 3*s.* 6*d.* It would appear, then, that in order to earn this sum she would have to smooth about 1,000 handles every day. (Evid. 24.) The sticks produced in these shops are for the most part very ordinary and cheap, and certainly not so necessary or useful to society as to justify the subjection of children to the evils of early labour.

Education.

9. Most of the children I questioned were too young to have gained any education, whether they had been at school or not. Most of them had been at school before they began to work, and were still learning to read at the Sunday schools. A few boys had not been to school at all. (Evid. 18, 19, 20.)

I have, &c.

FRANCIS D. LONGE.

EVIDENCE.

Evidence.

Mr. F. D. Longe.

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MR. W. DANGERFIELD'S, UMBRELLA AND PARASOL HANDLE MANUFACTORY, BLISS MILLS, CHALFORD, STROUD.

1. *Mr. W. Dangerfield.*—The branch of my trade in which children and young persons are principally employed is the manufacture of wooden handles for parasols and umbrellas. The work consists principally in polishing and varnishing handles cut out of beech and other wood. Some of the boys are also employed in making bone tips and buttons. With the exception of the boys employed in sawing bone the younger hands are principally employed in helping the older men and women. Very few girls are employed in the bone work. The youngest girls are employed in carrying the sticks from the varnishers and placing them round a little stove to dry. The varnish used contains naphtha, methylated spirit, shellac, and a little white lead, and sometimes red lead. I used to use lead in larger quantities, but finding it injurious to the health of the workpeople I have substituted other colours which do not require it. The varnishing goes on every day, but I do not think there is more than 3 cwt. of lead used in the course of the year. I hope to dispense with the lead altogether. Parents have complained of the effect of the lead on their children. There are between 250 and 300 hands employed in the manufacture in my works, and about half the hands would be under 18 years of age. Our regular hours are from 7 a.m. to 6 p.m. all the year round. They breakfast before they come. They have an hour at 12 o'clock for dinner. The machinery always stops for dinner, except on Saturday, on which day they take only half an hour for dinner, and leave at half-past 3 instead of 4, which was the regular time. If they are going to work overtime they have another half hour at 5 for tea. Most of the hands employed at the machinery work by the piece. During the last summer the machinery has been kept going for a week or fortnight together to 8 o'clock, but not for a longer period than this. The circular saws are driven by water-power, are now being worked to 8 every night owing to the want of water we have experienced lately, but only two or three young hands are employed on them. The varnishers have worked for two or three months overtime in the year. Our business is an order business; we cannot make for stock, but only make up particular kinds of goods according to order. I have silk mills besides, in which there are several hands under the Factory Acts. I should think there were 90 half-timers between 8 and 11 years of age. If this work was put under the Act I think I should dispense with the younger children, but I have not sufficiently considered the matter. I pay all the children myself. Their wages average 1*s.* 6*d.* a week. In the silk mills the half-timers get 1*s.* 3*d.* to 1*s.* 6*d.* a week. The half-timers begin with only 6*d.*, and then rise up to 1*s.* and 1*s.* 6*d.* Much of the machinery in the silk mills is standing now for want of hands.

BONE-CUTTING SHOP.

[This shop was very low and badly ventilated, crowded with men and boys. The air was loaded with bone dust.]

2. *David Griffin*, foreman of bone turners.—I have worked in this trade as a bone turner for 24 years. There are about 10 to 14 men employed in cutting and turning bone. I never knew any man complain of being affected by the bone dust. The boys at the saws cut their fingers sometimes, and are laid up for a day or so. About eight weeks back a boy cut his finger with the circular saw. He was laid up for five or six days, and then came to work again. I do not recollect any other bad cut within the last six months.

3. *Charles Cook.*—I am going 8. I have worked here about half a year. I gather and carry bones downstairs. I come at 7. I go away at 6 at night. I have stopped to half-past 6 only one night. I get 3*s.* 6*d.* a fortnight. I went to school afore I came to work. I was two or three years at school. I go to school on Sundays now. I read Testament at school. Father is an engine driver at a mill. I have five brothers and sisters; two are younger than me and don't work.

4. *Alfred Marsh.*—I am going 11. I have worked here two years and rather more. I drill bones. Before that I sorted bones. I come at 7. I go away at 6 every night. I have worked to 8. I am paid every fortnight. I get 4*s.* a fortnight. I leave for dinner at 12. I come back at 1 o'clock. I never worked through the day without going away for dinner. I always go at 12 except on Saturdays, when I go at half-past 12. I come back at 1 o'clock then. I leave off at half-past 3 on Saturday. I never worked beyond half-past 3 on Saturday. I have worked a fortnight together to 8. I get 5*s.* when I work late. I was at school two years. I go at nights now. I go at half-past 7 and come away at 9. I pay 2*d.* for three nights in the week. I have only been two weeks. I am reading Testament at school. I do nothing else. Father works on the line.

5. *Andy Davis.*—I am 13 years old. I have worked

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here between five and six years. I saw bone (with the circular saw.) I have done this for 12 months. I have cut my fingers several times. I once staid away eight days for a cut. I get 3*s.* a week. I come at 7. I go away at 6. In the summer I worked one or two weeks to 8. In the winter I worked one or two weeks running to 8. I get 1*s.* 6*d.* a fortnight more when I work to 8. My saw always stops at 12 o'clock. I get my dinner here sometimes. I live two miles and a quarter away. The bone dust gets into my throat sometimes and makes me cough. I don't know any other boys who go to school from here except me. I have two brothers and one sister who work here. My sister is 18. My younger brother is going 11. He is working a circular saw. He gets 1*s.* 6*d.* or 2*s.* a week. I staid away about two months ago. I had the pain in my stomach, and my head was bad. It was after I had been working to 8 o'clock. Mother said it was too long o' working.

6. *Richard Webb.*—I am going 11. I cut bones. I have worked the saw ever since I came. I have worked here a year and a month. I have cut myself, but never so bad as that I staid away. I come at 7. I go away at 6. I have worked to 8 sometimes. I worked to 8 last night and the night before. I have stayed away once or twice for half a day when I had the headache.

7. *Charles Jones.*—I shall be 12 on the 2nd of December. I have worked here more than three years. I cut up bones. I have had one bad cut. I stayed away a month. I have also stayed away for back ache two or three days. I have not stayed away more than twice because I was bad. I never went to school. I get 5*s.* a fortnight.

Wood-turning Rooms.

8. *Frederick Weaver.*—I am going 11. I have worked here about a year and a half. I sandcloth sticks. I come at 7. I go away at 6. I left at 6 last night. I have often worked three nights to 8. I don't know how many weeks I have worked to 8. I have been to school. I can't read. I go to school on Sundays now. Father and mother both work here. I have three sisters. I get 4*s.* 6*d.* a fortnight.

9. *George Grange.*—I am going 10. I have worked here two months. I am working a circular saw. I cut pen handles. I was seven years at school. I can't read much.

Varnishing Room.

10. *Mary Anne Herbert.*—I am going 11. I have worked here getting on for three years. I sandpaper sticks. I come at 7. I go away at 6. I sometimes work to 8. I sometimes work a whole week to 8, except on Saturday. I have never worked two weeks running to 8. I sometimes go away at dinner time, when I am not well. I have been bad two or three times since I have been here. I was working with red lead when I was ill. The doctor said it was the red lead. I never work with red lead now. I was two or three weeks laid up then. I have never stayed away since I gave up working with the lead. I dine in this room. I always bring my dinner with me. I go to school on Sundays. I can read the Bible at school. I read little books at home. One of them is about Abraham and Isaac.

11. *Elizabeth Warren.*—I am 13. I sandpaper. I come at 7. I go away at 6. I have worked here two or three weeks. I have been to school ever since I was a little maid. I cannot read much. I can't read anything except the Testament. I get 1*s.* a week. I live a mile off. I get my dinner here.

12. *Adelaide Clarke.*—I am just past 12. I have worked here a little more than two years. I varnish. I varnished some red lead sticks last week. I don't think the red lead ever hurt me. I never sandpaper red lead sticks. I generally go at 6 at night. I worked to 8 last winter for several weeks. I get 1*s.* 9*d.* a week when I don't work to 8. I was at school four years before I come. I go on Sundays now. (Can read.) I read the Bible and little books. I read at home sometimes.

13. *Rosanna Wear.*—I am 10 this month. I have worked here nearly 12 months. I move sticks. I come at 7. I leave off at 6. I sometimes work to 8. I sometimes work two or three nights to 8. I generally get my dinner in this room. Once or twice I have stopped away because I was not well. I never stopped more than half a day away. I have been to school. I can read the Bible. I read little books sometimes.

14. *Elizabeth Wear.*—I am 15. I have worked here six years. I sandpaper. I have sandpapered white lead sticks. I do that in this room. There is a little dust from it. I have stayed away two days altogether when I was ill. The lead never hurt me. I go away at 6. I never worked more than two days running to 8. I generally get my dinner here. I don't leave the room at all while I am at work during the day.

15. *Caroline Rice.*—I was 8 last Monday morning. I have worked here about 12 months. I stick-move. I come at 7. I go away at 6. I sometimes stop to 8. I have never worked three nights straight a-head to 8. I get 2*s.* 6*d.* a fortnight. I have been to school. I can read out of the Testament. I have no little books. I read at school.

16. *George Henry Hennings.*—I shall be 7 two days after Christmas that's coming. I have worked here five months. I stick-move. I generally go home at 6. We worked to 8 in the winter, and sometimes in the summer. I get 1*s.* 6*d.* a week. I can't read very well. On Sundays I go to school. Father works here. There are six of us altogether. Sister and one of my brothers work here. There are three younger than me.

Messrs. J. and R. Jones, New Mills, Chalford.

Bone-cutting Shop.

17. *George Young.*—I am going 15. I have worked here two months. Before I came here I worked at Dangerfield's. I was five years there. When I first went I drilled bone. I afterwards cut bone, and then I turned bones. I was about 11 when I cut bone. I cut my fingers sometimes. I was laid up about two months altogether. I once saw a boy cut his finger off. He was going 16. I come at 7 o'clock. I leave at 6. I never work over now. I go away to dinner sometimes. When I was at Dangerfield's I stopped away six weeks. I was ill. I caught cold.

Wood-turning Room.

18. *Thomas Gardner.*—I am going 14. I have worked here about two months. I worked at Dangerfield's three or four months. I was there two years ago I come at 7. I leave at 6. I work to 8 sometimes. I sandpaper sticks. I get 2*s.* a week. I cut penholders at Dangerfield's. I never went to school. Father has nothing to do now. He works in the fields.

19. *Joseph Gardner.*—I am going 10. I have worked here about two months. I get 2*s.* a fortnight. I never went to school. I can't read.

Varnishing Rooms.

20. *Mary Ann Smith.*—I was 11 last Saturday at 7 o'clock. I was here a week and three days before last Christmas. I come at half-past 7 and go away at 6; sometimes at 5. I sometimes stop to 8. The week before last I worked all the week to 8, except Saturday. I get 2*s.* a week. I am paid every fortnight. I stick-move. I go to school on Sundays. I was at school before I come here. I can't read anything besides the Testament.

21. *Emma Jeffries.*—I am going 9. I have worked here nearly two years. I have only one sister at home. I have two brothers older than me. I come at 7. I go away at 8 sometimes, and sometimes at 5. I have worked two weeks running to 8. I never

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worked four weeks running to 8. I have worked three weeks to 8. I stick-move. I sandpaper the tops. I never went to school before I came here. I go on Sundays now. I have staid away—not very often, not more than two days at a stretch.

22. *Felix Augustus Franklin.*—I am going 11. I have worked here 12 months. I stick move. I come at 7. I go away at 5 sometimes, and sometimes I work to 8. I never went to school much. I can't read.

Mr. H. Hooper's, Griffins Mill, Shalford.

23. *Mr. H. Hooper.*—I have no bone cutting. I employ children and young persons in making umbrella and parasol sticks. Our regular hours are from 8 in the morning to 6 at night. We never begin earlier than that. My hands nearly all work by the piece. There is a little boy and girl to each varnisher. The boy moves and the girl papers. There are not more than twenty boys and girls under 15.

24. *Mary Ann Godwin.*—I shall be 13 on the 10th of next March. I have worked here about 12 months. Before that I went to school. I came here once before, and then left and went to school. I was not wanted. I come at 8. I leave at 6 every night. I sometimes work to half-past 6 or 7. I never work after that. I get my dinner at 1 o'clock. I leave at 4 on Saturday. I sometimes work to half-past 4 on Saturday. I get about 3*s.* or 3*s.* 6*d.* a week. I get 1*d.* a gross. It takes me about an hour or an hour and a half to do a gross. I smooth the handles with sandpaper.

25. *Thomas Pates.*—I was 10 on the 10th of last October. I have worked here nearly two years. I stick-move. I come at 8. I go away at night. Sometimes I go at half-past 6; sometimes at 7, and sometimes at 8. I often work to 8. I get 2*s.* I earn it. I am paid by the number of sticks I do. I go away for dinner at 1 o'clock. I come back at 2. I never went to school except on Sundays. I sometimes stay away from work for the headache.

26. *Jane Hooper.*—I am going 14. I sandpaper. I have worked here better than 12 months. I went to school before I came. I come at 9 o'clock. I generally go away at 6. I get my dinner at 1 o'clock. I sometimes work on without stopping for dinner. I eat it as I work. I can read. I read little books now sometimes.

Messrs. Clarke's, Steam Saw Mills, Stroud.

27. *Mr. W. Clarke.*—In the ordinary work of sawing timber we should only use one or two boys of about 12 or 13 years of age. This work goes on in open sheds. In making umbrella handles and walking sticks we employ about 40 hands altogether. About one-half of them would be under 15; only two or three under 12. We have no bone cutting.

28. *George Tensett.*—I am going on for 13. I file wood for parasol handles. I have worked here about four years. When I first came I fish-skinned. I come at 7. I go away at 6. I sometimes work to 7 and 8. I never worked a whole week to 8. I was eight years at school. I read Testament on Sunday at school. I cannot read anything else. I go away for dinner at 12. I come back at 1. The machine always stops at 12. I get 3*s.* a week. I used to get what I could earn at fish-skinning. I cut my fingers at the saw,—only once; I was away from work a week.

9. *Sarah Ann Davis.*—I shall be 10 next April. I have worked here about two years. I stick-move. I come at 7. I go away at 6. I sometimes work ten minutes later. I go to school on Sundays. I get 1*s.* 9*d.* a week. Father works at a flour mill. I have four sisters and three brothers. There are four smaller than me. I can't read very well. I read the spelling-book.

The Bobbin Manufacture.

Mr. J. E. White.

K.

REPORT upon the BOBBIN MANUFACTURE, by Mr. J. E. WHITE.

To Her Majesty's Commissioners.

Gentlemen,

Nature of the manufacture.

1. Bobbin making is a trade subsidiary to the spinning and weaving manufactures, in which large quantities of bobbins are used, and not unnaturally it is carried on chiefly in the same parts of the United Kingdom. The material worked upon is wood, and the chief processes are sawing, turning, boring, and smoothing, all done with the help of machinery, such as circular saws, lathes, drills, &c., worked by power. In general steam power is used, either alone or together with water power, but in some cases in country mills water power alone is still used.

Kindred works.

2. The manufacture of bobbins is not always distinct, but is sometimes found in connexion with work of other sorts, but requiring the same kind of mechanical appliances or processes. Thus some works are described by the owners as "saw mill and bobbin manufactory." In another manufactory which I visited, there is a department for making weaving shuttles, which involves also an amount of metal work. Other things, such as common cotton reels and some miscellaneous articles requiring turning, such as brush handles, trenails, or round wooden pins for railway rails, &c., are sometimes made. Hence it is not easy to define the exact limits of the trade. The places of work in which bobbins are made usually pass by the name of "bobbin mills."

Its seat.

3. From the census returns for 1861 it appears that of all the persons in England and Wales classed as "bobbin makers and turners," nearly the whole are found in Lancashire, the West Riding of Yorkshire, Nottinghamshire, Westmoreland, and Cumberland. In Ireland the trade is stated to be confined to Belfast and its immediate neighbourhood; and in Scotland to be carried on chiefly in the towns of Glasgow, Paisley, and Dundee, all seats of textile manufactures, and on a small scale in a few other places.

Uniform character.

4. From what I found, however, at the places which I visited in the north of England, and the information which I received there from persons who were acquainted with the manufacture in other parts, the nature of the employment appeared to be so simple and uniform, and the conditions under which it is

carried on to vary so little in different places, except in respect of the hours of work, that I did not consider it desirable to extend my visits to other districts; judging that for all practical purposes a sufficient representation of the employment is given by the instances furnished in the evidence.

A general account.

5. An almost complete account of the employment as a whole is given by a witness of wide practical experience (No. 3). It will be necessary for me to make but few remarks of my own in reference to the present subject.

I.—Age at which Children and Young Persons are employed.

From 8 years.

6. A few boys begin to work in bobbin mills at 8 years old, and many, it is said most, at 9 or 10. From 11 to 13 is the present age of a large portion of those who do mere boys' work.

II.—Sex. Number of Girls and Women.

Scarcely any.

7. The number of females of all ages in England and Wales engaged in bobbin making is put in the returns of the last census at "three." I have seen more than this at work in one place, but none of them under the age of 13; and I am informed that females are employed in a few places, but probably the number is at present so small that it is of no importance.

III.—Number of Children and Young Persons employed.

Estimated number.

8. According to the census for 1861, the total number of male bobbin makers and turners in England and Wales is as follows, viz.:—

All Ages.	Under 20 Years.	20 Years and upwards.	5—	10—	15—20
2,174	842	1,332	35	382	425

Taking off two-fifths for the proportion between 13 and 15 and between 18 and 20 years of age respectively, this gives 264 children and 408 young persons engaged in the trade in England and Wales. Probably, however, judging from what I have seen of the nature of the work, a somewhat larger proportion of those between the ages of 10 and 15 should be taken from the class of young persons and added to that of children. I have not had the means of forming a like estimate of the numbers employed in Ireland and Scotland.

Some in factories under regulation.

9. I am informed, however, that in several cases in England and in all but two in Ireland, bobbin making is carried on as part of the business of factories which are under the existing factory regulations. In such cases, the same system of hours, &c., would naturally be adopted in the bobbin department, but it does not seem as if the latter could rightly be considered within the definition of "factory," as given in the Act.

IV.—Hiring of Children and Young Persons.

10. Nothing need be noticed under this head.

V.—State of Place of Work.

Dust.

11. Bobbin making causes a considerable amount of dust, and it is, therefore, of importance that the work-places should be airy and well-ventilated. Two or three which I have seen are particularly roomy and light, and I have seen none which are crowded. The nature of the work does not easily admit of it. But regular ventilation or means for admitting fresh air or carrying off the dust seem to meet but little attention.

Its removal desirable.

12. It seems clear that appliances, such as fans, &c., for carrying away the dust from the workers, would be beneficial, *i.e.*, if they could be adapted to the nature of the work. But they do not appear to have been tried in this trade. In the few places which I have visited I have never seen any such appliances, and a bobbin turner, who has worked in a great number of places in the three kingdoms, states that he never has, though he has found a great difference in the closeness or airiness of work-places. In one mill I noticed air holes along the wall, but they were all stopped up. A frequent cleaning down of the dust from the roofs, ceilings, and other places seems desirable. In other respects the bobbin mills which I have seen call for no remark. Most are in open situations.

VI.—Nature of Employment.

Hand work.

Lathe ditto.

13. The work at which the younger boys begin is merely hand work. Some put on glue with a brush; others put in small pieces of wood, called "bushes," with a hammer, sort bobbins, carry away the pieces sawn by the sawyers at circular saws, &c. The first machine work done by them is boring, "rincing," or cleaning out the mouths of the holes bored, and "roughing," a kind of rough turning, all works done at lathes worked by power. Some of the boys who "rough" lean back each time a piece of wood is completed, in order to press on a strap passed round behind their backs, which then throws out the piece of wood. Some who bore sit on the front of their work benches, with their bodies twisted on one side towards the boring tool. I did not, however, find any bad effect attributed to either of these kinds of work.

Turning.

14. The work done by boys is seldom of a kind in itself causing much dust till they get to turning, which may be about the age of 14. The younger are, therefore, little subject to dust, except what is spread generally over the place, and they work at different benches or places from the turners and others engaged in dusty work. These, however, are often exposed to a great amount of dust, which settles thickly on their hair, dress, &c.

VII.—HOURS OF WORK.

Hours in factory towns.

Elsewhere, longer.

15. In factory towns the hours are the same or nearly so as the factory hours, though sometimes exceeded till 7 or 8 p.m. In the English Lake district, and it appears generally in country places and where water power alone is used, the stated day is longer, usually 13 hours, viz., from 6 a.m. till 7 p.m., less two hours for meals. In two or three places the stated day is spoken of as being not long ago as much as 14 hours, and even, in a busy time, 15 hours. There are exceptions to the general rules. Thus, in a bobbin mill near Windermere, the factory length of hours is kept, as supposed by a workman, because the owners have a factory in Lancashire subject to those limits. In Dundee, where the hand-loom weavers keep up the long-hour system, from 6 a.m. till 8 p.m. is usual, or was so, a few years since.

VIII.—NIGHT WORK.

Night work exceptional.

16. At a mill which I visited, worked only by water power, work is continued in any available part of the 24 hours when water is short in summer, but usually so as not to employ boys in the period between 8 p.m. and 4 a.m.; but, at another mill, worked only by water power, the stated day is never exceeded. Night work, probably, is very exceptional.

IX.—MEAL TIMES.

Cases of shortening.

17. Where the factory day is the standard, the factory meal times naturally follow. Where the day is as much as 13 hours, two hours are reckoned for meals. But the allowed meal times are, in certain manufactories, shortened in fact, so as to make up for leaving earlier on Saturday or in the evenings. Thus, in two manufactories the dinner hour is shortened to half an hour, and in a third to 40 minutes, the other meals being shortened likewise for the same purpose.

X.—HOLIDAYS. XI.—TREATMENT.

18. I have nothing to remark under either of these heads.

XII.—ACCIDENTS.

Mostly slight.

19. Till boys get to the lathes their work does not expose them to accidents, and then seldom to anything serious. They get cut or pierced by the tools on the lathes, but chiefly on the hands only, and the hurts are said to be slight. As a boy often works with his body fronting the boring tool, and leaning forward to push the wood home on to it, it looks as if a slip forward would result in piercing his body, but I heard of no such case. Still a plan which I saw at one mill for moving the wood against the tool by means of a frame looks much safer, and seems likely to have been adopted for that reason, though even there it was only used for some of the work, and said not to be suitable for all.

Avoidable ?

Putting bands on dangerous.

20. The only serious accidents spoken of are where boys have got up to the drums to put on their bands, work which it seems desirable should be intrusted only to men.

XIII.—WAGES.

Average.

21. For young bobbin mill boys, say those under 13 or 14, from 3*s.* to 5*s.* a week seems about the average earnings in neighbourhoods which I visited, but I made but few inquiries on the point, and the rate will probably vary much in different districts.

XIV.—INFLUENCE OF EMPLOYMENT ON PHYSICAL CONDITION.

Bad effects.

22. Employers or managers and several workmen have informed me that they do not consider the work unfavourable to health, stating also, in some cases, that owing to the dust it might be thought likely to be so. Other persons have informed me that it is decidedly unhealthy, inducing in particular affections of the chest. Grounds are shown for this opinion (Nos. 12, 13, 3, 4). The incumbent of Staveley, a village with three bobbin mills, referring to facts observed there, has expressed a strong opinion as to "the injury to the constitution" from the work. (This statement does not appear in the evidence.)

23. I should here, however, draw attention to my former remark, that the younger boys usually are not themselves engaged in work causing much dust, but only share the general dust of the place; and also remark that this varies greatly in different kinds and places of work, and that often it has not been such as to attract my notice as in any way remarkable, while in some parts in which boys work there is none.

XV.—MORAL CONDITION.

24. On this point I made but very slight inquiry, and the boys whom I questioned were very few. But of these few, some had never been at school, and one or two but very little, and some were unable to read. A clergyman considers that "the half-time system would be a great boon to the lads physi-
" cally, mentally, and morally" (No. 13). As to want of instruction, see also Nos. 14, 17, 19, 21, 8, 3.

XVI.—GENERAL REMARKS.

Other manufactures closely resembling.

25. The inquiry which I was directed by you to make was confined to bobbin mills. I have already remarked on the work of other but like kinds sometimes carried on in such places in conjunction with bobbin making. From what has come under my notice, I judge it probable that if wider inquiry were made into manufactures concerned with wood working generally, or substances requiring the same mechanical operations, it would be found that a large number of boys are engaged in them under conditions closely resembling those found in bobbin mills.

Shuttle makers.

26. The making of shuttles has a natural connexion with that of bobbins, and might properly be treated with it. The number of shuttle makers in England and Wales, as far as appears by the last census, was 526 males, more than five-sixths of them in Lancashire and the West Riding of Yorkshire, and 126 under the age of 20.

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Other wood workers, as turners, &c.

27. The returns of the same census (Table XIX., Order XIV., Sub-ord. 2) give the following number of persons engaged in one branch of wood work alone, which probably much resembles the bobbin mill employment, viz. turning, as follows:—

England and Wales—Males.

	All Ages.	Under 20 Years.	20 Years and upwards.	5—	10—	15—20.
Turner	7,628	1,785	5,843	21	437	1,327

The number of boys and youths returned under each of the heads of "sawyer" and "cooper" is larger absolutely, but far smaller relatively to the number of adults. Sawyers, as already shown, form an essential part of the workers in bobbin mills. It might be a work of some trouble so to define bobbin mill employment as, on the one hand, not to leave out work of the same nature as bobbin making done in such mills, or as, on the other, not to include the same operations and processes as found carried on in other trades or manufactures.

I have the honour to be,
Gentlemen,
Your obedient servant,
J. Edward White.

Lincoln's Inn,
27th February 1865.

EVIDENCE.

Evidence.

Westmoreland.

Mr. J. E. White

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Mr. R. H. Fell's, Bobbin Manufacturer, Troutbeck Bridge, Windermere.

1. The mills stand on a small mountain stream, by which they are worked, with only a few scattered houses in their immediate neighbourhood. The proprietor states, "A few years ago I adopted the "hours prescribed by the Factory Acts, but after a few months' trial my hands petitioned me to allow "them to work their present hours," viz., from 6 a.m. till 7 p.m., with two hours off for three meals. "Were the lads," he says, "prohibited from working the same hours as the adult hands, it would be "impossible to carry on the business, as lads are so scarce in these thinly populated districts that "relays could not be procured." Of the 50 persons employed in the mills only three are boys under the age of 13, seven more under that of 18, and the rest men. Referring to the small scale of bobbin works generally, and the conditions under which they are carried on, he adds, "While recognising the "desirability of limiting the hours of children and young persons in thickly populated districts and "close rooms, I consider it unnecessary in this business."

2. *Mrs. Fell.*—Our work varies a good deal, according to the supply of water. We have no steam. As near as any account can be given, taking one year with another, we work, perhaps, nine months full time, and the remaining three about half time. In summer, when water is scarce, and there is not enough of it to keep the whole works going at once, we let one part of the works run by day and another by night. We generally manage the work then in this way, viz., one of the two mills runs from 4 a.m. till 12 noon, and the other from noon till 8 p.m.; and the big saw, which takes a great deal of power, from 8 p.m. till 4 a.m. The sawing is men's work. But very likely for half these times the work may have to stand for want of water, or run only an hour or two. These stoppages are all dead loss. Of late we have not tried to make it up. We cannot do it well; some want to work on and some don't.

3. *George Owen*, bobbin turner.—I have worked in my trade in most of the districts in which it is carried on, not only in England, but also in Ireland and Scotland. I have worked in several towns in Yorkshire, viz., Leeds, Bradford, Halifax, Sheffield, Barnsley, Ripon, and Pateley Bridge; also in different places in this neighbourhood, both in Westmoreland and Lancashire; at Derby, and two country places in Derbyshire; at Mansfield in Nottinghamshire, Leicester, and Coventry. Coventry is the furthest place southwards in which I know of the trade being carried on. In Ireland all the trade is in or close to Belfast; in Scotland it is mostly in and near Glasgow. I have worked both there and at Paisley; also at a place in Galloway, and at Aberfeldy; and I have seen how the trade is carried on in and near Dundee and at Perth, having been in those parts in search of work. A little is done as far north as Inverness.

In some of the places the work is carried on as a separate business, in others as part of the business of regular factories, which are under the factory laws. In all bobbin mills either steam or water power is used, in some both. Other things besides bobbins are made in some cases, *e.g.*, shuttles, and a few other kinds of wood turning, as brush handles, &c. It is reckoned that a good bobbin turner can do any kind of turning, for cabinets or anything; I have worked at turning brush handles myself in a bobbin mill. In all places the work is much the same as to kind of employment. It is very rarely that any females are employed, but they are, I believe, in a few cases.

Where the work is done in regular factories the hands work the factory hours; and in factory towns generally the bobbin mills work the factory hours, or but very little longer. But in some places, especially where water power is used, which is chiefly in small country places, the hours are longer, as in this Westmoreland district from 6 a.m. till 7 p.m. One of the Staveley bobbin mills, however, works the factory hours, because the owners, I believe, have a thread factory away in Lancashire. In a country place in Derbyshire, where I was about four years ago, the hours were from 6 a.m. till 8 p.m., and on Saturday till 6 p.m. The hours were the same, viz., from 6 a.m. till 8 p.m., in Scotland, when I was there a few years ago, except in Glasgow and Paisley, where the factory hours are kept. Even in Dundee, though it is a factory town, they had the same long day. Long hours are nothing particular there, as the hand-loom weavers work so long and late, all night, I believe, at times. In Scotland, in a busy time, I have known the hours to be from 5 a.m. till 8 p.m. I have understood that at Inverness they work as long. I do not remember any place where if the men wrought long hours the boys did not work the same. The boys are forced to do so, as they

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are getting work ready for the men, and we take it from them.

In making one of the simplest kinds of spinning bobbin there are several processes. First, sawing the wood, drying it, boring, "rincing," or clearing out the ends of the hole bored, glueing, bushing, or putting a small piece of wood into the hole, rincing again, turning, sand-papering, and oiling. This is a kind of bobbin made, as it is called, by hand, *i.e.*, where the tool is held in the hand, though the lathe is worked by machinery. A machine made bobbin is cut out of the wood by blocking or cutting by a kind of boring saw, and has to be roughed, a kind of rough turning, done by boys. A mill as large as this, which has about 50 men and boys, is a fair sized place. It is a big place that has 100. I know about four such. Some have only four or five workers. About 25 men and boys may be called an average size. The proportion of boys under 18 years of age to men is generally somewhere about the same as here, and the boys run much about the same ages as those here.

Putting boys so young to the work, viz., commonly about 9 or 10, is almost the worst thing in the trade. They work that hard that they get fairly mashed up while young, and it crushes their growth, and they can never get to know a thing as they ought, to read or that. They do not usually go to night schools, in the country at least. It would be a very good thing to get this Factory Act, and it is generally thought so in the trade. Even since you have been in here I have been asked to speak about the boys. It is a thing very much thought about in the trade. If a man has several sons he is almost forced by his master, in many cases, to bring them to the work, even before he would wish it, or though he would like to keep them at school longer. Unless he will bring them the master will very likely refuse to have the man. The men may perhaps think that the Act will be good for them, but it will do more good to the boys than to the men, the men generally working by the piece, so that it would not make so much difference to them.

Boys begin usually at glueing and bushing, *i.e.*, putting bushes or little bits of wood into the bobbins. Then they get to "rincing," boring, and roughing, and afterwards to turning, to which they are usually apprenticed. When they have learned that they are at the top of their trade.

It is not till boys get to turning, which may be somewhere about 14 or 13, perhaps older, that their work makes much dust. The amount of dust depends very much on the kind and size of the bobbin, the dryness of the wood, and also on the kind of wood. Hard foreign woods are the worst. Ebony is like a solid substance inside you, and if you come to cough and spit, it comes out like a round lump. It also tickles the nose and makes you sneeze, like snuff, and makes your eyes twinkle. In all kinds the work is reckoned very bad for the stomach. The dust gets in and causes indigestion, and the way we work, leaning over, &c., causes a bearing down of the chest. The haft of the chisel rests just touching the chest, but only lightly. A bobbin turner spits up a deal of phlegm and thick with dust. A good many get into the habit of spitting just after they get to turning. It is just a habit for getting clear of the dust. Hand-made bobbin work is more dusty than the machine made; the face is nearer to the tool, which is held in the hand. In machine-made bobbins a handle is pulled, which pulls the tools together. In some places more machine work in coming to be done. It would be good, so far, but it would do away with a deal of hand-turning.

Besides the dust in turning, there is dust also, and more of it, in sand-papering, which each turner, man or boy, has to do if the bobbins are hand-made. Sand-papering one kind of large bobbins is the dustiest work in our trade. A turner sand-papers each bobbin for himself as he finishes turning it, but it only takes a small part of his time. A piece of sand-paper, or rather glass-paper, of this size (4 inches by 3 inches) will last with some kinds of work for two or three hours, and with some kinds will be worn out in two or three minutes, *e.g.*, if the work is large and made across the grain. Where girls are employed it is, I believe, chiefly in sand-papering and varnishing at lathes. It is a kind of work which girls can do, and if they can, it would take too much money to have men.

There is a great difference in different work-places as to comfort and healthiness. Some are so close that if you come in on a warm day it is fit to knock you down. In such places you feel as if you were like drowsy, and hadn't air enough. Others are quite large and airy, and if they are it takes the dust away, so that it does not hang about your face and annoy you so much. If you were to go over to yon side, where they are doing big bobbins, you would see the dust lying very thick on the top of men's coats. If there were openings above they would carry the dust up more. In all the places where I have been I never saw or heard of any contrivances anywhere for carrying off the dust, such as the grinders' fans which I have seen in Sheffield, or any other contrivance for the purpose.

Men in the trade in general are of opinion that the work is not healthy. Very many spit, and many go off in consumption. About the time that I came here last year two men died of it at Staveley, one a young man of 26 and another an older man of about 50. Another from Staveley is lying bad of consumption now. I am in bad health myself. A short time ago I had to go to the doctor, (Dr. Dobson. See No. 12), and he said that he thought it was this consumption coming on. He asked me how were the places that I had been in for ventilators, and I said that ours here was very bad. It looks a deal cleaner now, as we have just had the ceiling and walls swept. He spoke of one or two work-places near here as very good, but said that others were pinched up, and that the unhealthiness was a good deal from there being no ventilators to carry the dust away. I had to give up work. I took to spitting blood, and for about a week brought it up twice a day as much as a pint at a time, perhaps, before I could get it stopped. I have lately come back to work, but can't do much. I can't stand to it, but have to sit; my back feels as if it would drop and let me down on my knees. I have pain there and had it in my chest. As a boy I never had much to complain of in health. I was at the strongest and heaviest that ever I was when about 17. After about 20 I never carried much flesh, and I began to get very bad in my breathing, and have been so ever since. I am now 29, and began the trade at 12 years old or soon after.

The accidents to boys which I have seen have been mostly slight, such as hurts on the hand from the boring tools, &c., but I have known of two or three serious cases. One lost his life, another his leg, and one or two an arm. This sort of accident generally arises from a boy trying to put his band on the drum himself. It is chiefly men who have occasion to put bands on the drums, but if a lad uses a band he puts it on himself. Boys are apt to try and do things that they ought not. It is few places where there are rules against the boys putting on bands.

[This witness's appearance bore out his account of his health. His general account of the bobbin manufacture was given in a manner showing good intelligence.]

MESSRS. CHADWICK, BROS'., BOBBIN MANUFACTURERS, STAVELEY.

4. *William Philipson*, age 17, bobbin turner.—Have worked here 10 years. Am sure it is 10, because I know that I was just about 8 when I came, and I am now nearly 18. Our hours are from 6 a.m. to 6 p.m., with half an hour for breakfast and the same for dinner. We used to have an hour for dinner

when we left on Saturday at 4 p.m., but since the hands wished to leave early on Saturdays, viz., at 12.30, as we do now, we have only half an hour for dinner every day, so as to make up the time. We never work after 6 p.m. in winter, or after dark in summer, but we have then sometimes worked longer, till 8 p.m. for a week together perhaps. Have come a few times early in the morning, at 1, 4, 3, and so on, but only some of us that were at particular jobs that were wanted finished. One time a few of us worked all night as well as the day; they wanted to get some bobbins off.

When I began I put in bushes. Got perhaps 1*s.* 6*d.* a week just at first, and had risen to about 6*s.* a week by when I was apprenticed to turning. Had so many gross to do, and what you make more is overtime. Have now to make 13*s.* worth a week and get 6*s.* of it, and as much more as I make over the 13*s.*

Don't like the work, it is so dusty, and stuffs you up so; but it's different according to the kind of wood and the job. Alder and ash are very bad, if dry. The dust chokes up your stomach, and you are obliged to spit it up, or you couldn't get on. It stops your breathing. All would tell you the same. Sometimes feel a tickling in my throat. Sometimes your hair is as white as can be with the dust. (*Q.* Is it healthy work?) Nay; I never heard any say it was healthy; I have heard them say that it wasn't. Have lost a great deal of time sometimes because I was not well. Have the rheumatism, and pains in the small of my back. The doctor didn't say what it was from. Sometimes, when the work has been very dusty, I feel a pain in my breast. Have been bothered with a deal of headache; a good deal of 'em has it, and some never has. The work used to have a very great effect of my head; stimulated it like, as if you couldn't stand, and make me quite dizzy. (*Q.* Is there much noise?) Why, you'll have to shout if you want to get anybody to hear you speak.

Have been hurt often. If you've come to look about such things as that, I've catched it. One time I bored right through my elbow. Another time I split through the part between my thumb and hand. The bit that you bore with flew out and struck me. It was not properly put in. It was not my place to put it in; I was too little to look after such things as that; was about 10. Have sometimes been away two or three weeks for a hurt; it just depends on how you get hurt. Sometimes your sleeve gets twisted round the spindle and pinches you, but the spindle stops itself, and I have known several get caught in the band of the grindstone at which we grind our tools. Never saw any one break a limb.

Can read, write, and sum; learned in the evenings at home, and last winter went to evening school.

[Has a slight cough.]

5. *George Rigg*, age 14, rougher at a lathe.—Came to work five years last Easter, *i.e.*, when I was just about 9. It is easy work, and not so dusty. Sometimes bits fly in my eyes, sometimes not much. In two or three summers have worked till 8½ or 9 but not so often. Started on a Monday and worked five nights so. Was not tired; did an easy job then. Get generally 5*s.* a week, sometimes 6*s.* 6*d.*

Have only got hurt once or twice, when the boring bit went in.

Sometimes the foreman takes a strap to us, and the men take sticks and straps and all, but they don't really hurt us; we hardly care for it.

Can read and write, but not do many sums. Was at school before I came to work.

[A boy, apparently, of weak constitution, and in the opinion of the youth (No. 4.) "as little fit to work as any."]

6. *John Black*, age 13.—My hand is tied up because the bobbin split in a knot and the boring bit went into my hand.

[Another boy whom I spoke to had his hand tied up from a slight hurt from the same cause.]

7. *Mr. J. Marson*, manager.—This is about the largest bobbin mill in the neighbourhood. There are 31 boys, the two youngest 8 years old, and about 50 men. The hours are from 6 a.m. till 6 p.m. The business is very regular, and not subject to fluctuation. There is no overtime, at least there has not been since I have been here (*i.e.*, a few years), except now and then to make up for lost time. We are not stopped by want of water, as we have steam; but we use water-power also, and sometimes the mill is waterlogged by there being too much water, as in a flood. The steam would not drive the machinery then, as the water presses against the wheel and checks it. This is not isolated from the rest of the machinery. It might perhaps be so, but it would require an alteration. Sometimes, too, the machinery may break. When overtime is made perhaps they get up an hour a day by taking half an hour for tea and working till 7.30 p.m. The machinery always stops at meals. The work is dusty, but is not, I think, very unhealthy. The blocking is the dustiest work; that is done by men. If boys under 13 had to work only half time there would be a difficulty in getting a sufficient supply. There would be no other difficulty.

MR. PHILIPSON'S, BOBBIN MANUFACTURER, STAVELEY.

8. The mill is large and cheerful, but dusty. There are ventilators along the side, but they were closed. It was winter. Two or three boys had never been at any school, and some could not read.

9. *Mr. Philipson.*—I could not get two sets of boys under 13, or enough older boys to make up for them. The mill is a good mile from the village, and only three boys live near here. The men would have to stand for want of boys. We use only water-power. We have not been short of it to any amount for the last six years. The proper day's work is 13 hours, with two hours allowed for meals; but the men choose to take less, viz., 20 minutes for breakfast, the same for tea, and half an hour for dinner, so as to leave 50 minutes sooner. We never make overtime under any circumstances. The men and boys have always very good health. I have been in the business here 27 years. Some take their meals in the drying kiln, others in the mill.

10. *John Buckhart*, aged 10, rincer.—Was turned 8 when I began the work at another bobbin mill. Work here from 6 a.m. till 6.10 p.m., and till 7.10 p.m. on Thursday and Friday; Saturdays till 3.20. Breakfast and tea in the kiln hole; home to dinner. Had 2*s.* 6*d.* a week at my first place. Here get as much as I can addle.

MESSRS. SUART BROTHERS', BOBBIN MANUFACTURERS, STAVELEY.

11. *Mr. Rowland Suart.*—We begin work at 6 a.m., and work till 7 p.m. on Monday, Tuesday, and Friday, till 7½ p.m. on Wednesday and Thursday, and till 4 p.m. on Saturday. There are two hours daily for three meals. We never make overtime. We use water-power, but have had steam-power also for the last three years, because water has become shorter from the land being drained so much more. We have lately built a second mill, which is very airy; most of the boys work in this. I consider the work healthy. With three bobbin works in this small place there is not population enough for us to

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have two sets of boys under 13. It would annoy us very much. It would raise the wages, and drive the trade away. It is very difficult to get enough hands now. We encourage families with boys to take our houses if we can. Boys get from 3*s.* or 3*s.* 6*d.* a week up to 7*s.*; the roughers, say, 6*s.* or 7*s.* We could not get a man under 15*s.* We should like to be able to have boys from 11 or 12 years old. They get bound at about 14.

[A boy, aged 10, gave the same account of the hours. The new mill is very roomy.]

12. Letter from Dr. Dobson.

Dear Sir, Cleator Lodge, Windermere.

In reply to yours of the 16th inst. I beg to offer a very brief report to your notice.

The bobbin turners of this district (of course, I now write generally) are as a class a very pale, anæmic, strumous race of men, very different in build and physical powers when compared with agricultural labourers of the neighbourhood, and their osseous and muscular tissues are never called into active exercise; consequently they are imperfectly developed. Most, and I might say all, their time is spent in the mill during daylight; their mode of living is very bad; diet is mostly tea, coffee, and bread and butter; flesh meat and vegetables form a very small proportion of their food. Finding this state of things, shall we be surprised to hear that their physical powers are below the ordinary standard?

The diseases mostly assume a low and strumous form, requiring stimulant and supporting rather than lowering remedies; the diseases most commonly met with are phthisis pulmonalis, strumous disease of the bones, dyspepsia, and anæmia. Of these consumption stands first. I am confident, if careful statistics were made, the mortality from this source would be found alarmingly high, attributable to the following causes, viz., young and tender age of entering the mill, long hours, exclusion from sunlight and fresh air, dusty nature of work, mode of living, want of outdoor exercise, and in some instances to the badly ventilated and lighted mills.

The dyspepsia is often caused by living on tea and coffee in the place of more nourishing diet. Allow me to remark that in a county like Westmoreland, anæmia should be almost unknown, when we consider its fine open nature, its bracing and pure air, and many salutary advantages it possesses over populous places and manufacturing districts. While I am penning these hurried lines I have just admitted a patient whose case furnishes a good and fair example of many. He is a young, tall, and strumous man, who has been employed as bobbin-turner since he was 13 years old, working (with the exception of Sunday) from 6 a.m. to 7 p.m., occasionally doing "overtime." In some places two hours, in others one hour and a half, are allowed for meals. His diet has been such as I have described. To show the dusty nature of the work, he says that "his coat has often been covered with dust an eighth of an inch thick." He now applies to me with disease of the right lung and organic mischief of the heart. He may perhaps continue 12 months, and then die of softening of the lung. I give this as an example. I have tried to confine these remarks purely to the diseases met with, having said nothing of the ventilation, drainage, &c. Hoping that these hurried remarks will show you the necessity of legislative interference, such as placing under the Factory Act,

I am, &c.

J. E. White, Esq. Thos. Dobson, M.D.

13. Letter from the Incumbent of Windermere.

St. Mary's Parsonage, Windermere,

Dear Sir, Dec. 19, 1864.

I have been engaged this afternoon in making further inquiries relative to the employment of young persons in bobbin mills, and especially those in this parish, and I now send you the results.

(1.) There is a very decided opinion entertained among the wives of the bobbin turners (whom I conversed with separately and without any previous notice) that the employment is not a healthy one. It does not appear to lead directly to any disease, but it has a bad effect on the health generally. The bobbin-turners have a pale, sickly look. No man who is not naturally of a robust constitution can stand it. There is much stooping over the work, and as the air inhaled is full of fine particles of sawdust, which finds its way into the lungs and air passages, there can be little doubt that the work has a tendency to lay the foundation of diseases of the chest and in some cases of consumption.

(2.) The hours of work here are very long, averaging at least 11 hours per diem of actual labour for boys as well as men.

(3.) Not many boys are employed now here. The system of apprenticeship appears quite given up, still there are about a dozen or more in the mill. They do not appear to have actually suffered from attacks of disease, but the confinement, the long hours, the air loaded with dust, and the stooping, were considered by the mothers to have a bad effect upon the constitution, and several statements were made to the effect that they did not now and would not on any account let their boys work in the mill.

[The writer adds here a note as to reasons which might render the persons spoken to "unwilling to give any detailed cases of "ill effects."]

(4.) That the boys are sent to this employment very early is evident, for there are several who have been at work some years and are hardly more than 14, several not more than 13 years of age. I should say it was quite usual for them to go as early as 9 and 10. Of course this puts a stop to all schooling and mental improvement; even attendance at Sunday school is very scanty and broken. The half-time system in these cases would be a great boon to the lads, both physically, mentally, and morally. They grow up very rough and disorderly.

If there are any other points on which you wish for more detailed information, I shall be glad to furnish it if in my power.

I am, &c.

J. E. White, Esq. C. C. Lowndes.

14. Letter from the Incumbent of Staveley.

Staveley Parsonage, Dec. 22, 1864.

Dear Sir,

In reply to yours of the 16th inst., I have no further observation to make beyond the natural deduction from the fact of children being enticed early by good wages into a mill, which is that moral training and education must be neglected. We find it to be so. Those who have been sent by their parents at 8 and 9 years of age can do little more than spell out a few letters. * *

Yours faithfully,

J. E. White, Esq. Wm. Chaplin, B.D.

[There are three bobbin mills in this country parish, and, Mr. Chaplin adds, an "excellent school."]

Yorkshire.

Messrs. J. and T. Briggs', Bobbin Makers and Sawyers, Hind Street, Bradford.

15. *Mr. John Briggs.*—Our day is of the same length as the factory day, but the hands leave at 5.30 p.m., instead of 6, taking only 20 minutes for breakfast and 40 minutes for dinner. The usual hours in the trade in some parts are, I believe, 13, but in manufacturing towns like this the hands get privileges which they perhaps do not in the country. We sometimes make overtime till 8 p.m. The hands are allowed to

get tea then, but there is no regular stoppage; the engine does not stop. Boys sometimes get hurt with the boring bit getting into them, but there are no accidents with the bands. They do not lap round the shafts as they do in some work; the dust covers the grease. Boys do not begin at the circular saws till they are about 16.—A few young boys help the sawyers by carrying off pieces of wood. Besides bobbins we sometimes make trenails or wooden pins used for fastening the bolts in railway rails. The men keep up healthy and do not mind the dust.

16. *William Northope*, age 8.—I glue bobbins. Am working now from 6 a.m. till 8 p.m. We have to work over every night till Christmas, and have done so ever since last Friday week (*i.e.* from 25th November.) Regular hours and meals are (*as above.*) Get 2*s.* a week. Can read, write a bit, and sum; at school three years, here half a year.

17. *James O'Leary*, age 10.—Carry off wood for a sawyer. Am working over till Christmas. Was never at school, day or Sunday. Cannot read.

18. *Lewis Yates*, sawyer.—The work is of the same kind as here in the other bobbin mills in which I have been in several different places. In Ashton-under-Lyne we had the same hours as they have in factories, but we sometimes made overtime, perhaps for five or six weeks together till 7 or 8 p.m. or so.

19. *William Thomas Haig*, age 16, bush-turner.—Have been seven years altogether in a bobbin mill. This work, bush-turning, is dusty, but it suits my health as well as what I did before; have been at it three months.

Was at day school three weeks and at Sunday school three months; that is all. Can tell the letters, but not do much more. It would not do for me to go to school now; there's three little childer at home and only me to work for them.

[The dust lies thickly on his hair and shirt.]

MESSRS. CLAYTON'S, SHUTTLE AND BOBBIN MANUFACTURERS, THORNTON ROAD, BRADFORD.

20. Shuttles as well as bobbins are made here. The shuttle making involves a metal work department for making parts of the shuttles. Two boys were working at glazing wheels, glazing iron pins for the shuttles. Pieces of wood have been put over the tops of the circular saws as guards in consequence of an accident. They protect the worker from pieces of wood being flung against him by the saw, as sometimes happens from there being a knot or flaw in the piece of wood which is being sawn, or if anything catches against the back of the saw.

21. *Sampson Torr*, age 10, borer.—Here two years. Work from 6 a.m. till 5.45 p.m. All this week we have worked over till 8 p.m. Have a quarter of an hour to tea then. Get 4*s.* 6*d.* a week. Was never at the working (day) school. Don't know all the letters.

22. *James Titherington*, age 12.—Bore pin bobbins. Same hours. Have only begun working over till 8 to night. Don't know how long it will be for. Have not worked over before for nearly a year, *i.e.*, for three weeks before last Christmas. Was only at school six months. Can read pretty well, but not write very well.

23. I visited a saw and bobbin mill at Barnsley (Messrs. Wilson and Newman's) employing between 50 and 60 boys, the 13 youngest being between the ages of 10 and 13, and a few females, with about 70 men. The exact factory hours are kept. Steam power is used. A boy aged 11 (William Epworth) stated that he had worked until 8 p.m., but only two or three times; and a boy in another part of the works said that he himself had never worked overtime. Two or three girls sandpaper at lathes. One stated that they had to comb the dust out of their hair at night. A boy puts bobbins on a revolving machine fitted with knives, and it looked dangerous to see him put in his arm to pick out a bobbin that had dropped. The machine, however, moves very slowly. The bands at the boys' lathes are so arranged as to be free from danger. The boys "are not trusted" to handle their own bands, but have to call men. In some cases the boys push the wood against the boring tools by means of a frame instead of directly by the hands. This looks much safer, but it was said that it would not be suitable for all kinds of work.

REPORT upon INDIA-RUBBER WORKS.—By Mr. H. W. LORD.

TO HER MAJESTY'S COMMISSIONERS.

GENTLEMEN,

1. The great variety of uses to which india-rubber is already put, and the probability that this manufacture is still far short of its full development, make the employment of children and young persons in india-rubber and waterproofing works a more important subject than their actual number at the present time may warrant.

2. I am not able to state accurately what that number is. The census returns for 1861 give 1,290 as the total of "india-rubber and waterproof article makers or dealers" in England and Wales.* But this, if correct then, is certainly not so now; for in the five works visited by myself between 1,200 and 1,300 were employed, and there are several other similar places in existence.

3. I have visited three manufactories in the suburbs of London, and one, that of the Messrs. Macintosh, in Manchester. Of two others in the latter town, I received from Mr. Coles, with the authority of the proprietors, accounts which for the most part tally with the results of my own observation. I also visited the works of the Liverpool Rubber Co. There are others of a similar kind at Edinburgh and Glasgow. These have been visited by Mr. White, but are treated by him as a branch of the manufacture of wearing apparel (pp. 42 b. and 47 b., App. to 2nd Report).

Age, sex, and number.

4. Few children are employed; I met with one or two who had begun under 10, but most begin after 11. The number of persons under 18 at Messrs. Macintosh's is scarcely one-seventh of the adults,—51 to about 350: about three-eighths of the total number of hands are female. The same proportion holds for females in London; but that of young persons varies from one-third to one-ninth in different works.

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* In "London," as defined for the purposes of the Census, the returns show none under this head.

India-rubber Works.

Mr. H. W. Lord.

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5. The 1,290 given, as above mentioned, in the census tables for 1861 are thus distributed:—

	Under 15.	15—20.	Over 20.	Total.
Males - -	70	152	725	947
Females -	35	98	210	343
	105	250	935	1290

Hiring and wages.

6. The men hire and pay the boys who help them, but the females and the rest of the boys are paid by the principal. A boy of 14 is paid 6*s.* or 8*s.*, and a girl 6*s.* or 7*s.* a week.

Nature of occupation.

7. The work of children and of females is chiefly hand work. Boys mould balls in small iron moulds. Children of both sexes tie together threads, which a machine has cut, to be used in the manufacture of "elastic web." Boys of 12 or 13 also assist at machines, where the waterproof cloth is rolled, by holding the edges to prevent creases, and also by turning a hand wheel for winding the cloth. Sometimes boys of 13 "tent" a machine for cutting the block into sheets, or use a machine to cut threads or bands, but in London they are not trusted to do such work till they are 17 or 18. The girls make pouches, gum rings, and balls, pressing together the sides of pieces, which have been stamped out in the proper shape for the purpose. The young women make tubing, and cut out and make up coats, goloshes, &c. In the latter case the sewing machine is frequently used, but the mere pressure of the fingers, or the blow of a light mallet, suffices to unite the edges of the tubing.

Hour of work.

8. The hours of work are often long, from 6 a.m. to 8 and 9 p.m. being not unusual in Manchester, and in London also. Mr. Birley's evidence on this point, relating to the need to strengthen the employers' hands by legislative interference, is very valuable (No. 1). Some time after he had given it, on meeting me again he mentioned, in illustration of the difficulty he found in keeping to regular hours, that although work had been going on for some time before Whit week from 6 a.m. till 10 p.m. at his works, he should not have discovered it, but for the accident of one of the young women fainting at a tea-party given by him to the workpeople; this led to inquiry, and then he found that her exhaustion was attributable principally to having been working so long for several nights previously.

9. Among those whom I questioned myself at Manchester, I found a boy of 14, who had worked on most nights, except Saturdays, from August to Christmas, from 6 a.m. till 9 p.m., and a girl of the same age, who said that she was very tired after having worked till 9 p.m. from 6 a.m. for three weeks (Nos. 2, 4). Girls of that age in London have worked from 6 a.m. to 8.30 p.m. often for a fortnight together, and sometimes to 9.30 p.m. (No. 12, and see Nos. 10, 13, 17 as to adults).

Night work.

10. In one department of Mr. Hamer's works, a system of night and day turns was in use. This is not general in the trade, and would be discontinued there (No. 8). It has been adopted elsewhere in seasons of great pressure (No. 1).

Steam power.

11. In all the processes (such as rolling, washing, kneading, spreading, cutting, &c.), by which the rubber is converted from its natural state and prepared for use, steam power is applied to move machinery. The speed is not great in any case, but some of the machines, especially the rollers, used for amalgamating and reducing the rubber, are very massive. None but male adults are employed at them.

Accidents.

12. In most cases precautions have been taken against accidents by having the machinery more or less carefully fenced. Accidents are said to be rare; those which do occur arise for the most part through a hand or arm being drawn in between the rollers, and are usually very serious. The elaborate system of signals and the complete fencing in use at the works of Messrs. Warne, at Tottenham, show how much can be done to reduce the danger to a minimum (No. 10).

Effect of employment on physical condition.

13. The children and young persons seem not to be especially unhealthy. I could not hear of any part of their occupation being, in their opinion, injurious.† At the same time Mr. M. Hamer, whom I have not had any opportunity of seeing, has stated his opinion that the work is not healthy (No. 8). On the other hand, Mr. Birley, whose sincerity and regard for his workpeople are undoubted, states that the hands, who have suffered from ill health while working in the cotton mill owned by his firm, often change to the india-rubber works, and do so with great benefit to their physical condition (No. 1, and see Nos. 14, 17). The attention of the medical gentlemen whom I consulted had not been drawn to this question, the trade being, as I have observed already, one in which the number was not so great as to attract especial notice. Upon the use of sulphuret of carbon referred to by M. Delpech in treating of this subject, I beg to refer you to a letter received from Mr. Birley (No. 7, and see No. 14). I have found none but male adults employed in the vulcanizing department.

Education.

14. The majority of those whom Mr. Coles examined could neither read nor write (No. 8). At Messrs. Macintosh's, where especial pains are taken in the matter of education, only one or two of those examined by me could not read at all, but comparatively few could manage more than easy words; and Mr. Birley himself states that many of his hands are very ill educated. In London, I found boys of 14 and 15 unable to read.

Moral state.

15. Observations have been made to me by persons of experience as to the bad effect of allowing both sexes to work together in the same place, particularly where late hours are habitual (Nos. 1, 13).

General remarks.

16. There would appear to be but little objection to restrictions which should limit the work of young persons to 10 hours in the day, provided that the engines are not obliged to be stopped. "We are liable," says Mr. Birley, a zealous promoter of the factory system in respect of hours of work, "to seasons of great pressure in autumn and spring, having sometimes to work all night in relays; "but all our overtime and night-work might easily be done exclusively by adults." (No. 1, see No. 8.)

I have the honour to be, Gentlemen,
Your most obedient Servant,
H. W. Lord, Assistant Commissioner.

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* The case of the French chalk dust (No. 16) is perhaps an exception. Only one or two in each place have to dust the bands. In powdering the waterproof (No. 17) very little dust is produced.—H. W. L.

EVIDENCE.

India-rubber Works.

Mr. H. W. Lord.

1.

Messrs. CHARLES MACINTOSH & CO., Cambridge Street, Manchester. (April 1863.)

1. *Mr. Herbert Birley.*—I am a partner in the firm of Charles Macintosh & Co. We have a large factory for weaving and spinning cotton besides these works. I know of no reason why the Factory Act should not be equally applicable to one set of works as to the other; at all events so far as the limitations of age and hours of labour are concerned. Indeed, I should prefer for several reasons to be under regulations here as there. It would, however, be extremely inconvenient to be obliged to stop the engines, and cease all work at a fixed time all the year round, for we are liable to seasons of great pressure in autumn and spring, having sometimes to work all night in relays. But all our overtime and night-work might easily be done exclusively by adults.

The number of our young hands is not large; we have only 51 of both sexes under 18, to about 350 adults. Of those 51, 22 are male and 29 female, 9 of the latter, and 4 of the former being under 13. There was some slight error made in filling up the tabular form, which was done a month ago. I have had an accurate list of all under 18 made out to-day. About one-third of the adults are females.

We have no machinery in any department of these works at which females of any age are employed, with the exception of three or four sewing machines; and the greater number even of the lads, including all those under 13, are engaged in hand work, moulding small balls, which they put on the carriage to be heated, or tying threads and the like. Now and then, a boy of 13 or so may have to tent machines for cutting sheets from the block, which are almost self-acting, or to use a machine for cutting threads or bands.

The younger girls make gum rings and balls of various sizes, not merely moulding as the boys do, but fastening together pieces which have been before stamped out into the requisite shape. The older ones make larger articles, but in a more or less similar way. Some make tubing. A few dip the balls into colouring matter, and hang them up to dry; they are over 18. There is nothing prejudicial to health, I believe, in that nor in any part of the works. Indeed, so far from there being anything unhealthy, we often have hands that are unable from one cause or another to stand the work in our cotton factory, change over here, and find that their health improves in consequence. That pungent smell and taste which you notice is caused by the naphtha, used in dissolving rubber for spreading on to cloth. The india-rubber after undergoing various processes of cleaning and kneading is mixed with sulphur, and put into large closed heating vessels. That is wholly male adults' work, as is also the spreading, and, in fact, all the preparation of the material previous to its being converted to the shapes which it ultimately assumes.

Many of our hands are very ill educated; some attend our night schools; we have two of them twice a week, one at each of our day schools, the free school and the other. We have no factory school, but thought it on the whole better to have these two, one free, and one where the school fee is 3*d*. We find they generally sift themselves, those who can afford to pay sending their children to the latter; to this, of course, there are exceptions, but they are not frequent. Both these are Church schools, and open to all the neighbourhood; many, probably most of our hands, send their children to one or other of them, but they do as they please. I have always taken a great interest in their education, and encourage it as far as I can. I think the operatives are very ready to avail themselves of opportunities for getting their children to school, but many are really unable to pay the fee, not through actual poverty so much, perhaps, as from want of system, and careless habits.

With regard to those under 13 years of age, their getting employed here at all is always a mere matter of favour to their parents, at whose request they are introduced. We should prefer to have all over that age, and should have no difficulty in getting them; the work is attractive, clean, and healthful, and they earn high wages. The consequence is that parents bring their children to help them or their friends, so they get a sort of footing in the works. I find we have two girls as young as 10, and one boy and two girls of 11. Three of the four boys under 13 are helpers to the men, and hired by them. I did not know that they were working till 9 P.M., and have repeatedly forbidden any of the very young ones being allowed to stay after 6 P.M. But they and their parents like the extra earnings they have by working overtime, and those whom they help of course like to keep them so long as they are working themselves.

Most of our hands are piece workers, and are excessively jealous of new comers; they would at any time rather work several hours overtime than have fresh hands introduced. For us limitation of the hours would be more convenient, and more advantageous. We should save the gas in the first place, and besides that the effect of late work over night often is that they do not come till after breakfast on the following morning. Be that as it may, for the younger ones at all events, staying at work till 8 and 9 P.M. is bad, and I should be glad to see it stopped, but I cannot effectually stop it myself; the interests, pecuniary that is, and the habits of the work-people are both against me. I should be saved many altercations with the heads of some of our departments, if we were under the Factory regulations, as to the employment of children and young persons.

I am quite satisfied with the working of that Act in our mill opposite. We work low numbers there, coarser work that is, and the dust and flue affect the weakly; so that, as I have said already, they come over here in preference if they can; moreover, the work here is far less monotonous and wearisome than minding a machine.

I think it is a bad thing to have women working with men in the same room, or passing through shops where they work, even where the hours are regular; and where they are not so, it is of course worse. I have tried to put an end to that, but only partially succeeded. Most of our hands in the mill are females; we find them more manageable.

With reference to the effect of the Factory Acts on the employment of children in mills, I should say that they had certainly tended to reducing the number of the very little ones; particularly in the case of those who used to have to do the scavenging. Ten or fifteen years ago, many very small boys were employed to run under the ends of the mules and throstles and clean up, and although cleaning while the machine was in motion was forbidden, they often did so, and got caught and injured. Now, however, most mills in this district have "scavenger-rollers," on which the ends fall, if the thread breaks, and they supply the place of the children, or at least render so many of them and such small ones unnecessary.

Again, the increased size of the carding engines involving an increase in the size of the can, makes it necessary that the can-tenter should be bigger in order to be able to remove the can. The same is the case in creel filling, for the machines being higher than they used to be a small child cannot reach.

2. *Alfred Haslam.*—Am going 14; have been here two years last Christmas; work this machine

India-rubber Works.

Mr. H. W. Lord.

1.

for cutting bands. The foreman of this room is my father. Am working now from 6 A.M. to 7 P.M.; stayed till 9 P.M. every night last week. Was as late as 9 P.M. most nights from August last year up to Christmas, except Saturdays. Can read and write.

3. *Ralph Smith.*—Am going 14; have been here little better than two years. I tent this machine that cuts the sheet of india-rubber from the block. Am not working overtime now; have worked here till 9 P.M. for six or seven weeks together. Earn about 6*s.* a week in regular time.

4. *Lucy Salt.*—Am 14; have been here more than two years. Am making india-rubber balls. Get about 7*s.* a week; that is piece work. Have worked till 9 P.M. for three weeks together, was very tired; that was since last Christmas.

5. [The children and young persons employed at Messrs. Macintosh & Co.'s seemed generally healthy and happy. One room in which a considerable number of girls and women were at work, though large was very close and unpleasant, and many of the occupants looked pale; the foreman, however, on my noticing it, assured me that whenever he opened the windows they would shut them for fear of drafts the moment his back was turned, and they all declared that they were very healthy. I examined several, both girls and boys, as to the state of their education; some were able to read well, and answered simple questions of New Testament history correctly; one or two could not read at all, but most could read short words without much hesitation. The best had, I found, attended Mr. Birley's school, and still went there at night.

6. On a subsequent occasion, Mr. Birley informed me that after my visit some of the girls had, without his knowledge, been working for several days before Whit week (May 24–30) until 10 P.M. He had only discovered this to have been the case through being led to inquire into the cause of one of them fainting at a "tea" given them in the holiday week.—H.W.L.]

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7. Copy of Letter from H. Birley, Esq.

Manchester, September 29th 1863.

DEAR SIR,

I HAD seen the extract from "Galignani" in the "Times" of the 26th, referring to the use of sulphuret of carbon in dissolving and vulcanizing india-rubber, and am glad to have the opportunity of explaining to you, that although "bi-sulphuret of carbon," like naphtha, turpentine, or alcohol, would no doubt be injurious if used imprudently, it is not so if employed with ordinary care.

Bi-sulph. carb. is only *one* of the means we employ for vulcanizing rubber.

The department is well-ventilated, and none but adults are employed in it. Our use of bi-sulph. carb. extends over a period of 16 years, and, so far as we are aware, without injuriously affecting the health of those engaged in it.

The vulcanization of rubber is practised in France, and particularly in the neighbourhood of Paris, by work-people in their own dwellings, and consequently they have not the advantages of the arrangements adopted in large works for carrying off the fumes of the solvents.

I am, &c.

H. W. Lord, Esq. HERBERT BIRLEY.

MR. S. HAMER, ANCOATS, and MR. D. MOSELEY, CHAPELFIELD LANE, ARDWICK.

8. The following account of a visit to the works of the above-named manufacturers was, with their sanction, forwarded to me by R. W. Coles, Esq., Sub-Inspector of Factories.

DEAR SIR, Manchester, August 31st, 1863.

I VISITED on Saturday last, the india-rubber and gutta-percha factories of Mr. Samuel Hamer, Ancoats, Manchester, and of Mr. David Moseley, Chapelfield Lane, Ardwick.

The establishment of Mr. Hamer is chiefly for the manufacture of india-rubber, gutta-percha being simply used in small quantities for mixing.

At Mr. Moseley's factory, in addition to india-rubber, gutta-percha is used in large quantities as a separate manufacture.

In both places a great trade is done in preparing elastic for the elastic web manufacturers.

The chief processes are mixing, laying, vulcanizing, drying, cutting and making up.

The girls, whose ages average from 12 to 18 years, are chiefly employed in tying up the elastic bands into bundles, putting buckles on them, &c.

At Mr. Moseley's factory, a large number of females from 18 years old and upwards, are employed in cutting out and making up overcoats, &c.

The boys from 13 to 18 years old work chiefly in the laying and drying rooms at both places. I found no boys under 13 years of age at Mr. Hamer's, and only three or four at Mr. Moseley's factory. Some of the boys and girls professed to be able to read, a few to read and write, but the majority could neither read nor write.

In appearance they seemed as healthy as those employed in factories generally.

The average hours of work of the women, young persons, and children are from 6 o'clock A.M. to 8 P.M., with half an hour for breakfast, one hour for dinner, and about a quarter of an hour for tea, which last is taken in the workroom.

No night work is done at Mr. Moseley's, but in the drying department of Mr. Hamer's factory, the young persons (boys) are employed in sets, one half work by day from 6 o'clock A.M. to 6 P.M., the other half by night from 6 P.M. to 6 A.M., and change every week; on Saturday work stops at 2 o'clock in the afternoon, and the night set is not employed. Mr. Milton Hamer (nephew of the proprietor), who went with me through the works told me that they were enlarging their premises, and hoped eventually to do away with the night work.

Mr. Hamer said he should have no objection to an Act of Parliament, which would limit the hours of work from 6 A.M. to 6 P.M. He considered those hours quite long enough, especially as the occupation was unhealthy.

Mr. Joseph Moseley expressed the same view on behalf of his father, but he did not seem to consider the occupation so unhealthy.

The various uses to which india-rubber and gutta-percha are now being converted, and the great increase which has being going on for some years in the elastic web manufacture, lead me to believe that that this branch of manufacture is but yet in its infancy, and that ultimately it will open up a large field of employment.

I am, &c.

H. W. Lord, Esq. ROBERT W. COLES.

THE LIVERPOOL RUBBER COMPANY, VAUXHALL ROAD, LIVERPOOL.

9. In the absence of Mr. Somerville, another gentleman of the establishment conducted me through these works.

India-rubber Works.

Mr. H. W. Lord.

The manufacture is confined exclusively to that of shoes and goloshes. In making the material, adult males are employed. The rubber is reduced by heat and pressure; naphtha is used only as cement. The form of the article is stamped out first from the fabric by men, and then handed to women to make, varnish, &c. About 200 of the latter are generally employed on the premises, few being under 18. The binding is put on by sewing machines. The regular factory hours, 12 in the day, with 1½ hours for meals, are always observed. The work-people seemed generally healthy.

LONDON.

MESSRS. W. WARNE & CO., TOTTENHAM. (December 1864.)

Four hundred and eight persons are employed at these works, of whom 145 are females: 22 boys and 16 girls are between 13 and 18: 1 boy and 3 girls are under 13; the youngest is 10 years and 8 months old.

10. *Mr. Jaques* (the resident manager) conducted me over the premises, which are very spacious, clean, and well arranged. Great care is taken in fencing the machinery to have every cog wheel thoroughly cased over; there is moreover, in each department a danger bell, by means of which, in case of accident, a gong in the engine room is struck, so that the engine can be stopped directly.

Mr. Jaques stated that the engine could not be stopped to a moment for the meal times, as there might be a piece of rubber in some of the machines, or a piece of cloth being spread, or a "drum" of elastic being cut, which would be spoilt, if the process each was undergoing were not completed; to avoid this, bells with indexes communicate between the engine room and the other departments, and the engineer does not stop until all have answered his signal to do so.

The regular hours of work in the summer are from 6 A.M. to 6 P.M., with half an hour for breakfast at 8 A.M., and an hour for dinner at 1; in the winter from 8 A.M. to 8.30 P.M., with the dinner hour as before, and half an hour for tea at 6 P.M.; on Saturday they leave at 2 P.M. * Children under 14 make 5 hours a week overtime for about 3 months altogether at different periods of the year. Those between 14 and 18 work on an average 68 hours a week for about 6 months altogether. The adults are frequently later, sometimes till 11 P.M.

In one room about 20 girls from 12 to 15 years old were employed in "skeining up" the threads for elastic web and tying them in hanks together. A few boys of about 13 were employed to carry things about, one of 14 was winding cloth; those who were at the machines for cutting threads were stout lads or young men.

The women earn on an average 16*s.* or 17*s.* a week, and the little girls 6*s.*; none receiving less.

There is in connection with these works an excellent "institute" and dining room; the men and women, who do not live near enough to go home for dinner, dine in the hall, a central partition separating the two sexes. This partition is taken down, when the whole of the hall is required for lectures and other meetings of the operatives. At either end of the building there are suitable conveniences. There is also a small library for the use of the work-people; daily and weekly papers are supplied by the firm, who also furnished the cooking range as well as the building. An old servant of the establishment is allowed to cater for those who take their meals there, and I was informed that a good dinner could be got for 4½*d.* Altogether it is the most comfortable room of its kind that I have seen.

There is also a benefit society, which is managed by a committee of the men: besides the regular subscriptions of members, all the fines enforced for improper behaviour, talking, and other infringement of the rules of the works are paid into the sick fund.

Three boys, and three out of four girls whom I examined, read well. All these seemed remarkably well behaved, intelligent, and healthy.

11. *Elizabeth Adams.*—I am 10 years and 8 months old: have been here since last November year; never worked any where before. My mother is store-keeper in the same room that I work in. I make tobacco pouches. The next oldest girl to me is just a year older than I am. I have worked till 8·30 P.M. in the summer, but never later. I used not to come at 6 A.M. then, not before 8 A.M. I have never worked longer than from 8 A.M. to 8·30 P.M. That does not tire me.

12. *Lucy Holdsworth.*†—Am 14; have been here a year or more; skein up the threads in Mr. Holmes' room; never worked any where till I came here. The summer is our busy time; I have worked as late as 9.30 P.M. then; but never more than once a week; I came at the usual time, 6 A.M., then; when we go on after the usual time for leaving, 6 P.M., we often go on till 8.30, but very seldom later. I have worked till 8.30 P.M. every night in the week, but not for more than two weeks together. All the girls in our room but Harriett and two others can read; those two can read about as well as she can.

["Harriett," who was rather nervous, had read to me in the presence of this witness, and could manage only words of one syllable. She was 11 years and 6 months old, and had been 9 months at work.]

THE LONDON INDIA-RUBBER COMPANY, WEST HAM (Dec. 1864).

Between 70 and 80 persons are now employed here, this being the slack season; rather less than half of these are females. I found upon personal inquiry from the workpeople that the youngest female was 16 years old. One boy was between 12 and 13, and three or four more were 14 or 15. The rest, of both sexes, were 18 and upwards.

13. From *Mr. Hall*, the manager, and *Mr. Elston*, the foreman, who accompanied me through the works, I obtained the following information:—

The boys are employed either to carry cloth and other articles from one room to another, or to wind cloth on a roller by means of a hand wheel, or to coil the wire used for the interior of gas tubing, &c., a treddle being the motive power in the case of small wire.

None but males are employed in the various processes of preparing the material: the machinery con-

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* The statement as to overtime was furnished to me by Mr. Jaques, Mr. Fanshawe, and Mr. Widows, as the best approximate estimate they could arrive at after some discussion with me on the subject.

† I am not sure of this name.—H. W. L.

India-rubber Works.

Mr. H. W. Lord.

1.

sists chiefly of very massive and powerful rollers used for amalgamating the rubber with other substances, and reducing it ultimately to sheets of different thicknesses: there are also machines for spreading rubber, to be afterwards cut, also by machinery, into strings or threads for the warp of elastic web. For all these steam is the motive power, but they are driven very slowly. Mr. Hall stated that though accidents seldom occurred, those that did occur were, owing to the great weight of the rollers, very serious. They usually arise through the hand being caught by the rollers in taking the rubber out from or putting it in between them, and he had observed that they never happened to a novice, but always to a man who had had some years experience, so as in fact to have grown careless through familiarity with a danger from which new comers are protected by their fears.

The women make up and shape the material into the articles for which it is required, especially the garden hose and tubing of all kinds, rings, &c. No sewing is needed for any purpose, the adhesive properties of the material, by itself or with the addition of a solution, enabling the pressure of the fingers, or the blows of a light wooden mallet to unite the edges over the mandrils or metal tubes on which such articles are formed.

The usual hours are 59 in the week; from 6 a.m. to 6 p.m., with 1½ hours for breakfast and dinner on five days, and till 1 p.m. on Saturday with the breakfast half-hour. There are, however, seasons of pressure when the adults of both sexes stay till 8 p.m.: this constantly happens between the months of March and July, if the season happens to be dry, as garden hose then becomes in great requisition. In the autumn, also, there is a large demand for gas-tubing.

When the works first commenced, about two years ago, Mr. Hall adopted "American hours," 58 in the week, beginning at 7 a.m., and leaving as now, at 6 p.m., the dinner hour was at 12, and breakfast was taken before coming, so as to make 5 days of 10 hours; on Saturdays they left at 4 p.m.; they were paid as they are now, for 60 hours; but after a time they petitioned to have the system changed, and preferred the present plan, though by it they give another hour's work for the same pay, chiefly, as it would seem, from the force of the domestic habits of the district, which are opposed to getting breakfast ready before 7 a.m., or from a preference for the Saturday half-holiday.

Mr. Hall observed that he had a very strong objection, on moral grounds, to allowing women to stay at all late at any place of work where men were also employed, and would not have any of them stay after 8 p.m.

He and Mr. Elston both considered that overtime was very common in the trade; the reason being that although the Macintosh patent had expired, there are still secrets in the manufacture which would lead an employer to keep the hands he might have on overtime in preference to getting fresh ones, whom he must discharge when the pressure is over; while the hands themselves are pleased with the opportunity of earning extra wages, and therefore ready to work longer.

14. *Mr. Elston* informed me that he had known of boys being employed in india-rubber works at 8 or 9 years of age, but only to carry things about; and at 10 or 11 to cut bands, but they had always been sent away at the end of the regular day, and had not made overtime.

He thought the occupation healthy, having himself been in the midst of it for 12 years; he had not suffered in any way from it, though he had a decided tendency to asthma. Bi-carbonate of sulphur, though used for fancy goods in France, he considered to be very rarely, if ever, used in this country.

15. *George* ———.—Am 15; can't read; not at all: don't go to night school ever; always leave here at 6 p.m.: have 6*s.* a week.

16. The women all looked remarkably healthy: one, who was dusting bands with French chalk, said that it made her cough a good deal.

MESSRS. G. SPILL & CO., HACKNEY WICK.

One hundred and sixteen persons are employed here, 30 being females; the youngest, 2 boys, are between 11 and 12 years old; no girls are under 13: there are 22 boys and 7 girls between 13 and 18 years old.

17. *Mr. Spill.*—The youngest boys we have hold the edge of the water-proof cloth to prevent it creasing as it passes under the rollers. Those who are rather older turn the wheel.

Our hours are from 6 A.M. to 5.30 P.M. in summer, and from 8 A.M. to 7.30 P.M. in winter: an hour is allowed for dinner and half an hour for breakfast or for tea. We have not made any overtime for the last two years; before that time we often made two or three hours overtime, but we found that no more work was done than could be done in the regular hours, so we have now adopted a plan of paying for the day of 10 hours whether they work the whole day or not; in the summer time they frequently make only a three-quarter day, that is from 8 A.M. to 5.30 P.M. We have the same rule for our piece-workers, and as a matter of fact as much is done in 10 hours under proper management as used to take 13 or 14, for they used to loiter over their work in order to get paid for overtime; the employer saves a great deal in gas alone. They are paid at 2 P.M. on Saturday.

Besides tubing we make a great deal of sailors' oil clothing and the like; we employ young women at sewing machines making water-proof garments.

The least any boy is paid here is 1*s.* per day; those who turn the wheel get 8*s.* a week.

They are all healthy, the naphtha is considered very wholesome; in times of epidemic we are singularly free.

The water-proof cloth after being rolled is powdered with French chalk to prevent it from sticking.

18. [The youngest girl here was employed in the store-room, sorting leggings, she told me she was 13 and had been there 1½ years. Two boys, aged 14 and 15 respectively, were unable to read. One boy aged 10, the son of one of the men, was said to come only occasionally to bring beer and food for his father; sometimes he helped when the water-proof cloth was being hung up to dry; he said he could not read and did not even know his letters; his father, who was standing by, immediately caught him up and said he did, but admitted that he never went to school now. This man, Mr. Spill informed me, earned upon an average 30*s.* a week.—H.W.L.]

REPORT on ARTIFICIAL FLOWER and OSTRICH FEATHER MAKERS.—By Mr. H. W. LORD.

To Her Majesty's Commissioners.

Gentlemen,

1. In the course of my inquiry into the employment of milliners, I found that in some instances, both in the wholesale and the retail trade, the flowers and feathers used in that business were made or prepared for use upon the premises of the milliner. These instances, however, were so exceptional as to lead me to reserve my remarks upon them, and to make the manufacture of artificial flowers and the preparation of ostrich feathers the subject of separate investigation.

2. The prevailing fashions of the last few years have led artificial flower manufacturers in several cases to add to their own proper business that also of the ostrich feather making, though the two trades are still usually independent of each other. The latter, however, requires a number of producers, in proportion to the amount produced, so much less than the former, as to leave the total of "feather makers" comparatively small. (No. 51). At the same time the processes of the one are so distinct from those of the other as to make it more convenient to treat of each separately, although, as will be seen, the conditions of employment are for the most part very similar.

3. The manufacture of coloured flowers is almost entirely confined to London. Mourning flowers are made both there and in Manchester. In those towns the accompanying evidence was taken.

ARTIFICIAL FLOWER MAKERS.

Sex.

4. At some places men and a few boys are employed to stamp out, to colour, or to "vein" the leaf, or the petal of the flower, but the putting together of the various pieces, which go to make up the flower, is wholly the work of the female sex.

Age.

5. None of the boys are under 13. The girls begin usually at 10 or 11 years old. I met with some who were only a few months more than 8, when they first learned. These had then been either at home or at the smaller places, where from 5 to 20 girls and young women work together. Even in large factories, where 80 or 100 were employed, some were barely 10 years old. This was so both in London and in Manchester.

Number.

6. At the latter place the proportion of children employed is larger than in London. Out of about 90 in one case, 33 were under 13, the three youngest being between 9 and 10, but in London those under 13 are rarely one-tenth of the whole (Nos. 1, 6). Those under 18 on the other hand are very numerous, and form in some cases the majority (No. 5). The total number, and especially that of the children, varies with the season of the year and the nature of the work (Nos. 1, 6, 11, 19, &c.). Indeed it has in this trade become the practice only within the last 12 years to collect large numbers to work together; "it used to be very rare for 50 to work in one place" (No. 11); but now out of nine large establishments visited by me, five employ, when they are busy, more than 100 persons on the premises; at one there were seats for 180.

7. According to the last census the number of artificial flower makers in London under 15 is 463, and between 15 and 20, 2335; in other parts of England and Wales there are 550 under 15, and 2503 between 15 and 20, giving a total of 5,851 females under 20. There are only 4946 persons over 20 engaged in the trade, and of them only 620 are males.

Hiring and wages.

8. In Manchester the girls are, in some cases, bound apprentices to the employers for two years, receiving 1*s.* 6*d.* a week at first, and 2*s.* 6*d.* in about six months.

9. There is no system of apprenticing in the London trade. The children are sometimes all placed together as learners at a table under the superintendence of one experienced hand. In that case the employer pays, and usually hires them, but more commonly they are brought by a mother or an elder sister whom they help, or by an older hand who pays them a weekly wage from 1*s.* 6*d.* to 4*s.*

10. When paid by the employer they usually come for one month for nothing, and rise from 1*s.* gradually to 4*s.* or 5*s.* a week. A girl of 14, if industrious, may make 6*s.* 6*d.* or 7*s.* a week between 9 a.m. and 9 p.m. Most who are not learners are on piece work; 12*s.* is stated to be a fair average weekly earning. Some get considerably more. A young woman with a helper sometimes earns 1*l.* a week, working 12 hours a day. Some have received 35*s.* in one week, but then "tremendous hours" were going on.

Hours of work.

11. The hours of work in London, during the busy season, are indeed "tremendous." This season is variously stated as being from six weeks to three or four months twice a year. For a considerable portion of that time girls of 16 and upwards constantly work 14 and 15 hours a day, and occasionally as much as 18 (Nos. 4, 13, 20, 21). One girl, aged 19, had worked twice all night through and on till 5 p.m. on the first, and till 10 p.m. on the second occasion (No. 20). Even children of 12 and 10 have often worked 14, and sometimes 16 hours (Nos. 20, 22, 23, 29). The employers, however, generally as far as they can, prevent the younger ones staying very late; but their endeavours appear to have been fruitless in many cases, particularly where the child has been helping a mother or sister (Nos. 1, 10, 11). In some cases, after 13 hours work in the factory, girls of 16 take work home "enough to "last two hours" (No. 23).

12. This system of long and late hours of work is deplored by several of the employers and forewomen as being most prejudicial to health and wholly unnecessary. They consider that, if the workwomen would come early and punctually, and work industriously during the 12 hours from 8 a.m. to 8 p.m., or from 9 a.m. to 9 p.m., nearly if not quite as much work could be done, as is now got through on their premises in three or four hours more (Nos. 1, 2, 5, 6, 11, 12, &c.)

13. The fact that some employers have, in spite of the inveterate habits of their workpeople, reduced their hours of work to something like reasonable limits, suggests that a want of resolution, or of management, or of inclination, on the part of the rest is the chief cause for their example not having been successfully imitated.

14. The only other cause of late work is one usually alleged in trades which manufacture goods to supply to wholesale houses—sudden orders requiring immediate execution. Although comments have from time to time been made to me upon the utter indifference shown in such houses to the inconvenience or overwork resulting from their orders, in no instance have I heard such unanimous and such bitter complaints as from artificial flower manufacturers. Those who have used the strongest language have naturally been most averse to letting their names appear in connexion with it; but I am sure that many philanthropic gentlemen at the head of large wholesale city houses would be much shocked and pained, if they could realize the feelings entertained by many of these, so to speak, small manufacturers towards those who represent them in such transactions. An illustration of the short notice given by such houses, though not of the complaints above referred to, is given by a witness (No. 5) who mentions an order which he refused, received by him at 5 or 6 p.m. on the day before my visit to be delivered without fail the next morning; "it could not be done without working very late." And similarly another: "We had 50 orders one after another marked 'special,' or in some such way, "coming in at 8 p.m. perhaps, to be delivered without fail to-morrow morning; or an order at 11.30 "a.m. to be delivered in the city at 3 p.m. on the same day," (No. 10, and see 13).

Meal-times.

15. "When we are busy, they often take a very short time about their meals; that is a matter in "which they please themselves" (No. 2). Consequently, being on piece-work, they often work through their meal-time, taking their food at the work-tables (Nos. 5, 13, 15, 20). This is said not to be the case usually with the younger ones (Nos. 20, 22), but it does occur with them (No. 23). At some places young women, who began to work at 6 a.m., often had no breakfast till 11 a.m.; when working late, they had supper at 9 or 10 p.m. (No. 20).

Holidays.

16. There is unfortunately much slack time, nearly four months, in which little or no work is to be had by the majority of flower makers. They also have two or three days' holiday at Easter and at Whitsuntide. In busy times many work till 6 and even 9 p.m. on Saturday.

State of place of work.

17. Much of the work is still given out to be done in small places, where a family works with two or three others to help them. This is particularly the case with mourning flowers, violets, and other simple and common goods. In such cases the workplaces are mere dwelling rooms, sometimes back kitchens on the basement. These are often dirty and fœtid.

18. The accommodation in large factories is in many cases quite inadequate to the numbers employed there in the season. In one room which I measured the number of cubic feet per head was 131; in a second, 111; the latter room was calculated to hold more than 70 persons, the former about 14. In a third large room, when at its fullest, for six weeks or so, the cubic feet per head are 95, in another 86, and in a fifth only 70. The heat and bad air are very generally complained of; the gas burners often have neither glass nor shade. Small gas stoves used to heat the tools are commonly placed on the tables, almost under the mouths of the workpeople. In some cases, "the smell from the water-closets makes the whole workroom offensive" (No. 15). The business, strange as it may seem, is essentially dirty and "dusty beyond belief" (Nos. 6, 11). One witness finds it necessary to have one of his workrooms limewhitened twice, and another papered once, in every year (No. 11).

Treatment.

19. The children who help older hands, as a rule,* "get no benefit" from the extra amount of work they do, while they are being continually urged on to be "quick" and to "look alive," and, "if not "knocked about, are at least frightened or worried into over exertion." (No. 10). "The little ones are "kept late and cuffed about" (No. 11). "They are often very badly treated by those whom they help, "like little slaves in fact. They are not perhaps actually knocked about and hurt much, but there are "other ways of ill treatment than using hands to them. They nearly worry the lives out of them some- "times" (No. 25).

Nature of occupation.

20. The muslin, silk, or other fabric, of which flowers or leaves are made, is cut out by means of a hand-stamp, with edges sharp enough to pierce through 16 folds when smartly struck with a hammer. The material is placed for this purpose on a slab of lead. Leaves are veined, after being cut, by being placed between a pair of dies, and subjected to pressure. If the whole petal or leaf is to be of one tint throughout, the whole piece of stuff is coloured, before the "cuts" are stamped out. When the centre of the petal is to be left plain, each is coloured separately with a brush.

21. The above-mentioned are the occupations of the boys and young men, though females are also frequently employed to put on the colour, and sometimes to vein. The great majority of the women and girls are engaged in putting the petals together so as to make the flower; in forming the "culo," or the foundation on which the petals are stuck; in gumming, waxing, dusting (with potatoe flour for bloom, or with powder of blown glass for frost), twisting paper or silk thread on to the stalk, and in other details. "It is at the best a very fidgetty work, and especially for young ones" (No. 25).

22. The younger children usually have to open the "cuts" or layers of petals, &c. which have been stamped out in the manner before described, and to separate them into the 16 or more pieces of which they consist. For this purpose they use a pair of pincers or plyers; they also have to pass a fine wire through the centre of each of such pieces, when the flower is to be made in that way. Twisting thread round the wire to form the stalk, and threading beads, are also common occupations of children. Some are allowed to use a small goffering iron, a kind of single-pronged fork ending in a small bulb or ball, to curl the petal.

Effect of employment on physical condition.

23. All this involves delicate manipulation, and a great strain upon the attention of a child, particularly at the end of a long day's work and by gas light. One witness, an employer, speaking of flower makers generally, says, "The thumb and finger get frequently sore and covered with blisters from "working the goffers, and picking up and manipulating the very small pieces of material which they "use. Sometimes they have their thumb-nails cut across right down to the quick by the constant "friction of the wire or the silk thread which they twist on the stalk." He adds an instance of a girl who had her little finger so inflamed by the constant use of the goffering iron as to be unable to straighten it; her whole hand was cramped for "the best part of a twelvemonth" (No. 10.) This statement is confirmed by several (Nos. 19, 23). "I have known a girl ill for a fortnight through sores made by "winding the stalks" (No. 20).

24. The dust of the colour is complained of more than anything else in the business as being injurious both to the eyes and to the health generally. This especially affects the children, since it arises for the

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* See for an exception No. 15.

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most part from "opening the cuts" which is their chief work. "It gets on the hair and the pleats of "the dress, and lies quite thick on the table after a day's work . . . . the dust gets on to their eyelashes "and so into their eyes, I think, and irritates them" (No. 6). This account coincides with the experience of Mr. Taylor, one of the surgeons of the Central London Ophthalmic Hospital, an institution which from its locality has probably more cases of girls in this trade than any other of the kind (No. 31).

25. Some of the girls speak of the dust being bad by reason of its getting on the chest. The carmine is especially complained of as making one "feel heavy about the head" (No. 23). Some tie handkerchiefs over their mouths and noses when separating the pieces (No. 20), but this is seldom done.

26. The arsenic green is very rarely used now, and never dusted on as it once was. When used at all, it is mixed with gum, and spread moist on the muslin before the leaf is stamped out, so that there is no dust when it dries (No. 26. See No. 31, and Nos. 1, 2, 15, 17). Verdigris blue (sulphate of copper), which is spoken of as the only thing unwholesome in the sense in which the green was so, is very little used now, though it was very fashionable five years ago (No. 15).

27. The mere brightness of the colours, blue and carmine, is in some cases very trying to the eyes, and for this reason working day after day on a very dazzling colour is avoided by those who study the health of those whom they employ (Nos. 5, 6). "I have known girls with their eyes nearly out of "their sockets with making white flowers by gas light in winter" (No. 34). Threading beads is mentioned as being equally injurious under similar circumstances (No. 19). One forewoman told me that she always put them on black paper, so that they might be more easily seen and taken up by gas light (No. 25).

28. The eyes of the children become so bad sometimes, as even to attract the employer's attention (No. 10). The case recorded by Mr. G. Lawson, of the Royal Ophthalmic Hospital, Moorfields, shows the effect produced in the way of congestion of the eye (2nd Rep. No. 408, p. 186) by the mere late hours of work in a room overheated by excess of occupants and of gas light. Such conditions of work are no doubt productive of great physical evil among all, both children and adults; "all suffer "in health," whether long late hours be, as some think, the chief cause (Nos. 1, 13, 21), or heat and bad air (No. 2); or the colour dust, the hurried meals, and the constant sitting and stooping, which hurt the chest (Nos. 20, 22, 23). It would probably be impossible to apportion the amount of injury due to each one of these agents. Unhappily they are in most cases to be found all operating at one time in concert to produce a result, attributed to that one of them, which the constitution or the habits of each speaker predispose her to feel more acutely than the rest.

Education.

29. Many of the children are very ill educated. I have found girls of 10, 12, and 15 unable to read. "After they have once begun to work they don't ever get much schooling. Half of such little ones "never learn to read till they grow up" (No. 3, and see Nos. 7, 9, 34). "It is very sad to see their "ignorance; some do not even know their letters" (No. 25). "I find, say 9 out of 12, badly educated, "can perhaps read a little, but not write, and all of them have a very imperfect idea of right and "wrong" (No. 32).

30. In some cases the children are allowed and encouraged by the employer,—not always with success (No. 15)—to go to an evening school once or twice a week (Nos. 8, 12, 19), and one case is mentioned of the younger ones being allowed to go away to school for two hours in the day, returning afterwards to work again (No. 23).

31. In Manchester the state of education is rather worse than in London. A forewoman states that out of 50 in her room not 12 can read. Of eight girls from 10 to 13 years old, whom I examined there, only one could read fairly; four could not read at all; and three spelt their words of one syllable letter by letter. Most of them had never been to any day school.

32. In both places the neglected condition of the children is attributed rather to the indifference or the vices of the parents than to their poverty. "Some of the best educated are those who have had the "greatest disadvantages" (No. 25, and see Nos. 37, 40).

Legislative measures.

33. Those who observe these evils and deplore them, think that nothing short of legislative measures will remedy them. One "wondered that Government had not before instituted some inquiry into the "employment of children in the artificial flower trade" (No. 24). Another "would like very much to "have the whole trade governed by some sort of Factory Act" (No. 1). A third, who "would "give all the assistance in his power to any scheme to secure the enforcing of a regular system "of hours," adds, "but the difficulty will be to reach the small employers. Any regulation to be "useful must comprehend them" (No. 56).

OSTRICH FEATHER MAKERS.

Age. Sex.

34. Girls begin at 11 or 12 years old. The majority are probably under 25. A few boys are employed to help the men in dressing and dyeing; they are 14 or 15.

Number.

35. The greatest number employed at any one place visited by me was 62; this is unusually large; a few have as many as 30 or 40; most only 8 or 10.

Hiring and wages.

36. In Liverpool they are bound for three years; in London there is no system of apprenticing. Little ones begin with 1*s*. 6*d*. or 2*s*. 6*d*.; some have 3*s*. 6*d*. a week, and make 5*s*. and 6*s*. with overtime; they are hired and paid by the employers, though they help the older hands by preparing their work. Older hands earn from 10*s*. to 16*s*., and with overtime 18*s*. and 20*s*. a week.

Nature of occupation.

37. The children are chiefly occupied in clipping or twisting the feathers, and scraping the quill; the others sew pieces of feather together, tie fresh ends on, curl and mount. All the work is light.

Effect of employment on physical condition.

38. There is at times a good deal of flue and dust in the air, but I know of nothing else in the nature of the work likely to be prejudicial to health (No. 49).

State of place of work.

39. The work-rooms are however liable to be exceedingly hot and overcrowded; the cubical contents of one room which I measured were 125 feet per head. A good light is requisite, and therefore a good deal of gas has to be burned, while at the same time windows, usually the sole source of ventilation, may not be opened for fear of blacks or damp (No. 44).

Hours of work.

40. The hours in the season, though by no means so long or so irregular as those among artificial flower makers, are yet frequently too long, at all events for girls of 12 or 14. At one city warehouse,

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where they are in other respects very kindly cared for, the average for nearly three months, twice a year, is from 8 a.m. to 10 p.m.; on rare occasions they have worked there from 7 a.m. to 11 p.m. A girl of 14 had worked for four days running from 8 a.m. to 11 p.m. (No. 43). At another place, one of them, about 15, had worked from 9 a.m. to 12 p.m. day after day, for several weeks (No. 46).

41. This is no doubt very tiring (No. 47.) "Whenever I can manage," says the forewoman of the first-mentioned house, "I send the little ones home earlier, but even I, myself, have felt too tired almost " to catch the last omnibus home . . . . . I do assure you they never knock up even in our busiest time; " still I can't help thinking that it must tell on them sooner or later." But—and this is the real explanation of much of the apparent anomaly of overwork existing in many places, where, as in this case, the comfort and the welfare of the employed are studied by those who employ them—"I must own that " I do not like to say I can't get an order done, when it is brought to me" (No. 44).

Meals.

42. When little ones come early to work, they sometimes have not had time to get any breakfast before leaving their home, and are not in many cases so fortunate as to be under a forewoman, who can "send them into the kitchen for a cup of tea or coffee and something to eat," with perfect confidence that her employer would approve of it, if he knew it (No. 44).

43. Tea is usually had in the workroom; they take about half an hour, but generally have no fixed time for it. Most go out for dinner and take an hour; but piece-workers in this, as in other trades, often curtail their meal-times, when they are very busy.

Education.

44. They seem to be superior, as a class, to the artificial flower girls; I met with none who could not read a little, and many can also write.

I have, &c.
H. W. Lord.

EVIDENCE.

LONDON.

Messrs. Lockyer & Co., Shaftesbury Street, New North Road (July 12th).

London.

m.

1. *Mr. Lockyer.*—This is our dull season; we are busy for four months from February to May, and again for about the same time from August to November. We now have only 122 persons employed on our premises; 10 of those are males, the rest females, and only six of them under 18. None are under 13. We should have, when full, about 250 altogether; 150 or more here, and the rest at their homes. About 20 of them would be children under 13; some as young as 11. These are usually brought by their mothers or sisters to help them; we do not in any case hire or pay them ourselves.

We call our hours from 9 to 9, but for eight months out of the 12, we are as late as 10½ p.m., and very often work till past 12. Ours is the worst trade for irregularity; we cannot get the workpeople to come at 9 a.m. or anything like it. Many won't come till 11; they play on Monday, and don't do much on Tuesday; on Thursday and Friday they work hard; we have double as much work done on those two days as on the rest. On Saturday they leave between 2 and 4, and do very little in the morning. We have tried to prevent this, and used to shut nearly half of them out if they would not come punctually, but we could not carry it on, there were too few skilled hands, so that they were independent. This was a few years back, but still those who have been any time with us, know that they can always get work from others in the trade, and so would be ready to leave us if we controlled them. It is very bad for their health the working so late in close hot rooms by gas light. All suffer in health; those who are early and regular certainly are more healthy than the others, there is nothing unwholesome in the trade now that the arsenic green is disused, but the long late hours produce very great mischief.

I should like very much to have the whole trade governed by some sort of Factory Act; we could manage very well with working from 8 till 8, or from 9 till 9, and I am sure that the workpeople would like it too. Employers like myself would be pleased, and support any such scheme if it were general in the trade. It is not that all stay late night after night, but every night for three months or more at a time, there will be some 20 out of them staying till past 12; they will have come at about 10 a.m. We, the employers, perhaps, suffer more than any, for so long as any work is going on we must be about. I am sure that my wife's health has suffered in consequence, she has been about 10 years in the business. The children, who are hired to work, usually get away by 10 p.m., but if they are helping a mother or sister they will stop and go home with them.

The state of things is no doubt worse in small places. There are many small men, with whom we, in fact, compete, who occupy, it may be a six-room'd house, and employ six or seven little girls on day or task work, in a room upstairs or a back kitchen, and have their wives to finish off.

Good wages are earned at artificial flower making, it is almost all piece work; our women frequently earn 12*s.* and 15*s.* a week; one we have, who with a child to help her, earns over 1*l.* a week. They pay their helpers about 2*s.* a week, some have 4*s.* I should say that a fair average worker earns 12*s.* a week without difficulty in about 12 hours a day, allowing an hour or so for dinner. The meals, however, are not taken at any particular time; most take their dinner at 1, and have an hour for it. Many go home. Tea is taken at about 4½, they have it all at once, it takes about a quarter of an hour, but they don't leave off for it, they take it as they work.

2. *Miss Emma* (forewoman).—I am sure that all the workpeople wish their hours to be less and more regular than they are, but they cannot form a system for themselves, and no one employer can enforce rules on them, because the habits of the people are all the other way. What they want is to be all of them compelled to come and to leave at fixed hours, whenever they are working. They would earn as much between 9 and 9 as they do now by staying till 11 and 12, for the more they have of gaslight the less they are able to do. It is that, and not the mere length of hours that injures their health, the heat and bad air; the same persons are not often at work from 9 a.m. to 12 and 1 a.m., and in the manufacture there is nothing injurious now that the arsenic green is not used.

When we are busy, they often take a very short time about their dinner; that is a matter in which they please themselves.

The usual plan with the younger ones is to come to one of the older ones on trial for a month; after that they will be paid 1*s.* or 1*s.* 6*d.* a week for another month or two, and so they gradually pick up the trade, and are in time employed directly by the manufacturers. It is very rare for any to be apprenticed.

In smaller places there are more children in proportion to the total number, and they are younger than ours. The plan there is to pay so much a week and to task them with a day's work. If they don't get through it in the day they are kept till it is done. I don't know that they are commonly overtasked

3. *Mrs. Davis.*—I should say that more girls begin the artificial flower trade at 10 years of age than at 12; they have often been at a smaller place before they come to a house like Mr. Lockyer's. After they once have begun to work they don't ever get much schooling. Half of such little ones never learn to read till they grow up. I don't think that many of those who would be here in the day time are sent to school by their parents now while it is slack. They take holiday now. We have two or three days' holiday at Easter and at Whitsuntide; three oftener than two.

4. *Miss Mann.*—I am 24. I have often worked here till midnight, and later too. I have done so for three weeks together on every night but Saturday; we leave on that day at 2 or 3 p.m. I should begin work at about 10 a.m. I get quite knocked up at the end of the week, and am glad enough when Sunday comes. Many work as late as that; some who are only 16 or 17 years old; but the very young ones usually go earlier, unless they are waiting for a mother or sister to go home with.

5. MR. VERNON, HALL STREET, CITY ROAD.

When we are busy I have more than 100 on the premises; most of them are young women between 15 and 25; I should say that 35 out of 50 would be under 18.

For my own part I should be very glad to have a regular system of hours enforced, and would give any scheme to secure it all the assistance in my power. But the difficulty will be to reach the small employers. Any regulation to be useful must comprehend them.

It is impossible, as the trade is now conducted, to have any system of fixed hours at this or that particular establishment. Only last spring I said that I would not have any child stay here after 7 p.m., but the consequence was that I lost some of our best hands, and had to give up that rule; for there are many places where they never attempt to interfere with them in such matters, so they go off to them. There is no notice of discharge given on either side. We pay on Friday, and are never sure of having the same lot on the Monday that were with us on the Saturday. Some are no doubt steady, constant, and regular, but most change about to any place where they happen to hear of a good shipping order going on. The American war has affected us very much; a great number of our girls, finding trade dull for the last year or two, have gone to percussion-cap making and the sewing machines.

Another evil is, that the fashions now are so variable that we never make to stock; indeed we almost have become retail manufacturers, and depend on special orders for City houses. They often give very short notice; only yesterday, for example, I had an order by letter at 5 or 6 p.m. to be delivered without fail the next morning. I refused it, as I knew it could not be done without working very late; but many cannot afford to be so independent; indeed, the smaller men say to me sometimes,—It is all very well for you, but we must take the work when we can get it, and do it how we can.

I am quite sure that we could get through all the work we want in 12 hours, 8 to 8 might suit some, and 9 to 9 others; but a fixed time of that kind would suit the hands admirably; it would not do to regulate the children's hours alone, it must be for all the hands of all ages; for the women bring the children to help them; we have nothing to do with the hiring or paying the helpers; those whom we employ we pay by the piece.

They generally waste a great deal of their time; and get through as much in the last three hours of the day as in all the rest. Besides, no doubt our customers could always give longer notice than they do, and would do so if they couldn't get the work done otherwise.

Our great pushes are for six weeks or more twice a year, from the middle of April, and again from the end of August; but even then they won't come early; if they work on till 11 or 12 at night, they cannot be early next morning. We do, however, generally get the young ones sent off by 9 p.m. Yet they now and then will wait to go home with an older one. Only a night or two ago I made a great mistake by sending off a child who was staying late. I found out afterwards that she was helping a sister, and had some difficulty in keeping them from leaving in consequence of my interfering with them. Sometimes they stay for the mere warmth and comfort and companionship of the work-room, especially in cold weather, preferring that to going home to a room without a fire.

They usually have their hour and a half for meals, but as they are piece-workers, they please themselves. In the seasons they work through the meal-times often, particularly if there is a fête at Highbury Barn, or some such thing going on to lead them to wish to leave earlier than usual. In the slack time many get away into the country for 10 days or so.

We endeavour as far as possible to vary their work, so that one may not be day after day working on a very dazzling or a very dusty colour.

6. *Miss Wood* (forewoman).—I have tried to regulate our workroom, but it is more than I can manage; they will come late and stay late. Some are regular, and work perhaps from 9 to 9; we have one family of three sisters who do so, and earn 24*s.* a week. We do not allow any to come in after 10 a.m., but at some places many don't come in till 11, or even 12. At one time we said we would have no children, but they would bring them. The number of children varies very much; in one season, lately, we had as many as 14, but in another there was only one or two under 13; I do not think there are usually so many as 1 in 10.

Some of the workpeople always stay here and work for us, but most are what we call butterflies, and go off anywhere. They marry very young; I should say that most artificial flower girls begin to learn the trade at 10 years old, and marry at 18.

I quite agree with all that Mr. Vernon says about it being an excellent thing to limit the hours, and am sure that all the work we want could be done between 8 and 8; but these small men, who have their wives and perhaps another young woman, and two or three little girls to help, working all together in the living room, if not the sleeping room—they must be limited, too, or else all of our work would go to them. But it would be hard on those who have only about six months of the year to make their living in, to be prevented from making all they can during that time.

There is no apprenticing in the trade now: the work is too uncertain. Sometimes a kind of flower which requires much skill is very fashionable, and then, again, all you want may be mere stringing together that any child can do; probably they would be more regular if they were apprenticed.

There is nothing in what we use now that is positively injurious to health, but the light carmine and the brilliant blue do try the eyes very much, and the dust which they produce is beyond belief; we actually have to keep other colours away from the part where they are using those for fear of their being spoilt; it gets on the hair and the pleats of the dress, and lies quite thick on the table after a day's work. The opening a "cut" into the separate pieces of which it

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consists is always very dusty, and that is the children's business ; the dust gets on to their eyelashes, and so into their eyes, I think, and irritates them.

If we could only secure a steady trade all the year round there would be no need for any ever to work more than 12 hours in a day : indeed, many a one can earn 12*s.* a-week between 9 and 7 p.m. But for the last three years business has been very slack ; in the previous year we were very busy for nearly five months together, and the year before that, again, was that very wet year, and there was nothing doing at all.

7. *Eliza Gill.*—Am 12, began at 9 years old to help make flowers ; there were about 20 there ; have never been to school since I first went to work. (Reads very indifferently.)

8. *Mary Ann Yates.*—Am 10, began work at flower making a year ago ; have been here six months ; help an older one ; she pays me 2*s.* and sometimes 2*s.* 6*d.* a week ; come at 9 a.m. and never stay after 7 p.m. ; go to evening school on Mondays and Thursdays from 7 to 9 p.m. (Reads words of one syllable.)

[9. Another girl, aged 15, had been at work for 3 years. During that time she had never once been to any day or evening school ; she had forgotten everything she had learned before, and said she could not read the verse with which I had tested the other two. She looked very delicate. —H.W.L.]

10. Mr. George Elphick, Tuffnel Place, Islington.

We have now only two under 18, and 30 adults; all are women ; September is our busy time, not July. We very rarely have children to work for us, and when we do they would be learners placed at a table by themselves under the superintendence of some one older, and not helpers each one to a different person. That is a common plan, but we will not have it here. Ten years ago we had 10 or 12 learners at a time, but they have grown up, and are many of them still employed by us ; most that come to us now have learned something of the business elsewhere. The youngest we have is 15. We like them to begin early, at 12 or so ; it is like learning to play the piano, their fingers must be supple, and have a fine touch ; they are too stiff at 17 or 18 years old to begin then.

Artificial flower making is by no means so light a work as you might think. The thumb and finger get frequently sore and covered with blisters from working the goffers, and picking up and manipulating the very small pieces of material which they use. Sometimes they have their thumb-nails cut across right down to the quick by the constant friction of the wire, or the silk thread which they twist on the stalk. I remember one who used to be constantly employed in goffering had her hand bad for the best part of a twelvemonth. The continual rubbing of the warm iron inflamed her little finger so that she could not straighten it, and the whole hand was cramped.

Work commences with us at 9 a.m., the time of leaving is uncertain, and depends entirely upon the amount of work which each chooses to take out when she comes in the morning. This is wholly at the discretion of the employed, and as they are paid by the piece, their departure is regulated solely by their skill and the quantity they have to do. Some often stay till 11 p.m., and even later, and work in their dinner hour ; it is quite voluntary with them. If they like to take out work for a day and a half, and get through it in the day, they are paid accordingly. Many of them need every farthing they can earn, and would be very much distressed if they were prevented from earning as much as they could in the busy season to make up for the absence of work in the slack time. Indeed several here, when they heard that you were coming, were very much alarmed with the idea that you wanted to prevent them from doing so.

The fact is that our late hours are the result of outward pressure, the irregularity of demand, and the haste attendant thereon. All our work is for wholesale city warehouses, we do nothing for retail shops, and in the present state of trade we can never fix any period for a particular demand. We now constantly have a number of small pressing orders ; this has been worse in the season just past than it ever was before. We had 50 orders one after another marked "special," or in some such way, coming in at 8 p.m., perhaps, to be delivered without fail to-morrow morning ; or an order at 11.30 a.m. to be delivered in the city at 3 p.m. on the same day. Then the duty being taken off French goods has, of course, considerably affected the trade in England, Under these circumstances to prohibit late work. when there is work to be done, would cause the loss of quite a third of the business, and totally put it out of the power of the hands to earn their existence, which is even now most precarious, and would inevitably lead to a large increase of the social evil.

But if this inquiry is intended to aid the worker and prevent the oppression caused by the heavy "day" or "task" work, its results must be most beneficial. There is a great deal of that in our trade, and it is among employers with whom such a system prevails, that you will also find the younger children in the trade. These persons agree in the first instance to give their hands a fixed weekly wage, calculated on the basis of their doing so much a day ; after a little time they put the screw on, and work them up from four bunches a day, say, to four and a half, then to five, and even six by degrees, so that at last they get a day and a half out of them for a day's wage. It is especially on the children that this falls heavily, for they are of course much more frequently paid by time than by piecework. The same thing operates where the older hands are allowed to bring children to help them. Their object, of course, is to earn all they can, but the children are paid by them so much a day or a week, and get no benefit from the extra amount of work they do, while they are continually being urged on to "be quick" and to "look alive," and if not knocked about, are at least frightened or worried into over exertion.

A bad instance of the way in which such children who help older ones are overworked occurred in our own establishment some little time back ; directly I found it out I put a stop to it, but it was only by noticing the state of the child's eyes that we were led to inquire further. She was about 13, and came to help an older sister, who used frequently to make her stay and work till 11 and 12 at night. We were told once when we found her there late that she was only waiting for her sister to go home with her, but that was untrue.

It is very trying to the eyes to have to distinguish by gaslight, or perhaps as daylight is failing, between different colours such as blue and green, or different shades of colour very nearly alike ; and that a child would have to do in many cases. The mere putting the wire through the very fine holes in the centre of the little pieces of material, and the effort to observe which of two very nearly the same size should come next in order is, for a child and at such a time after a day's work, hurtful.

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11. MR. R. JOHNSON, 120, PACKINGTON STREET, ISLINGTON.

It is only within the last dozen years or so that employers in our business have had so many to work on their own premises. I employ about 100 hands now; it used to be very rare for 50 to work in one place. I take no learners; none of mine are under 15 or 16, and few under 18. Some three or four years back when I had fewer, I allowed them to bring learners to help them, but the little ones were kept late and cuffed about; and I had no benefit from them, but rather the reverse, so I ran the risk of offending the older ones, and refused to let learners come. I very nearly lost a great many, but none did leave me after all.

I have also succeeded at last in maintaining a rule about the hour of commencing work, and now I allow no one to enter after 9 a.m. I could not have done that when I employed only 20, but now I am not so dependent on their fancies. I have not yet succeeded in fixing the time for closing, but I have done some thing towards it; we now often leave off work at 10 p.m. when we are busy, and are seldom later than 11 p.m., and never work as we once did night after night till 1 and 2 a.m. It may take two years, or it may take 10, for I am obliged to do it very gradually, as I did the closing the doors in the morning, by 10 minutes at a time, but I intend, sooner or later, to do all my work between 8 a.m. and 8 p.m., and I am sure it can be done. When I began the trade I had to adopt the system as I found it, and at first we sometimes worked tremendous hours, but that at all events I have got rid of.

It is not those who work the latest that earn the most, but those who are steady and don't waste their time in talking and laughing. A good deal may be earned in this business. I have paid 1*l.* a week all round, and in some cases even 35*s.*; that certainly was when the "tremendous hours" I spoke of were still going on; but now I have at least 20 whose weekly earnings, taking the whole year through, busy times with slack, will average 15*s.*

A child ought to begin at 10 or 11 years old to learn our trade, but then she should never be kept as one child of 10 was here often till 11 p.m. That I stopped.

It is a very dirty trade, though you would scarcely think so. It takes three persons here every Saturday from 5 or 6 till nearly 12 p.m. to wash and clean the four rooms thoroughly. I have them lime-whitened twice a year, and where the walls are papered, have a fresh paper — a common one of course — every year.

I should say the cost of a complete set of tools of the best quality, including pincers and goffering irons, is under 5*s.* I supply those who work for me with what they want at cost price; for I can of course both obtain what are needed more easily, and buy them much cheaper at a wholesale house in a large number than they can at a retail shop.

12. MR. W. H. BOULTON, QUADRANT ROAD, ISLINGTON.

I have 10 females now working for me; four are under 13, and four more between 13 and 18; the youngest is within a month of 12. Our hours of work are from 9.30 a.m. to 9 p.m., and they never work after that. I believe that the employer gets no profit from children or young persons working more than 9 or 10 hours a day. At the same time, I am quite aware that my way is rather the exception in the trade. I am myself, comparatively speaking, independent of the business; but many employers are forced, through the great length of our slack seasons—four months in the year—and foreign competition, to keep their young people at work till very late hours at night.

The extension of the railway system throughout the country has tended very much to encourage giving short notice. Purchasers now come up from Manchester, Glasgow, or Edinburgh once every fortnight or so to the wholesale City warehouses which we supply, and give small orders, requiring immediate execution, instead of buying from stock, as they used to do. Years ago we were always able to work in the slack times so as to meet the demand of the next season, but now no one can say beforehand what will be in demand then.

I am bound to admit that the French workpeople in this trade excel ours; they take so much more interest in their work and have a pride in it; ours use their hands—make up what you put before them—but do not use their heads.

The younger ones go regularly to evening school, at 7 or 6 p.m. on Wednesday, I think it is; nothing will keep them here then. That is often very inconvenient; it may well happen that an older one, who has two younger ones to help her, is prevented from finishing some special order in time, when two hours more help from them would have made all the difference. I would much rather that none came before they were 12 years old, and got all their schooling over by that time.

13. *Betsy.*—I worked 18 months ago at another artificial florist's in Islington, where they were always very late; I was there 18 months; their busy time lasted for two or three months each spring and autumn. There were a good many there; no children; but girls from about 15 years old: I was 18. I often worked there every day in a week till 12 and 1 a.m. from 9 a.m.; sometimes I worked till 2 a.m. All were on piecework, and worked as late as they liked. It was not only now and then at a push, but every day, week after week. It quite knocked me up, so I came back here, where I had been before. We are certainly in better health here than the girls there were. Girls of 16 worked as long as the rest; they very seldom took the whole meal hour, but worked through it. It was their own fault; I mean they might have had the full hour, if they liked; often the late hours were caused by not getting any work to do till late, and then that being wanted in a hurry.

[14. The girls in Mr. Boulton's employment seemed generally to have stayed with him for a long time; several said that they had been 5, 6, 8, and 10 years there; most had begun work at 10 or 11 years of age; one had come when she was only a little over 9.—H.W.L.]

15. MR. W. B. BOTTING, BAKER STREET.

At our fullest time we should have about 130; we have at the present time 113 persons employed here; 14 of them are males; there are six girls under 13; all but one are over 11; that one is 10 years and three months old; 37 are between 13 and 18. They are all employed in making artificial flowers, except 10, who are preparing ostrich feathers; we have taken up that branch of business only within the last two years.

The men and boys are stamping out the leaf or colouring; three boys are between 13 and 18 years old. The only thing at all unwholesome, now that the arsenic green is not used, is the verdigris blue (sulphates of copper), which is applied damp to wreathes and not dusted on, as the green was; of that, however, very little is used now; five years ago it was very fashionable for evening parties in the winter season. None of those dusts need be injurious

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to the workpeople if the proper precautions are taken to cover the nose and mouth with gauze. The room in which these boys are is the hottest we have; it is made so by having the drying closet in it.

One of these boys, who is 14, cannot read; I have offered several times to let him go to night school three times a week and pay for him myself, but I can't get him to go.

We pay all our workpeople ourselves, the younger girls as well as the rest, though they are hired and brought by the others. We have different systems at different tables; some 17 or 18 are wholly paid by time, but most are on a mixed system of so much a day, and so much on what they finish at the end of the week. We have also a system of so apportioning the payments that the younger ones in a set may get a fair share of the payment for what the set does; so that, for instance, if the chief one happens to lose time in the week, the younger one or two with her who work on in her absence, may have some benefit of that work for themselves.

The learners usually come for a month for nothing, and have, perhaps, 1*s.* a week for the next month, then 1*s.* 6*d.* or 2*s.*, and so on, gradually rising; after some time they are able to work by themselves. A very fair sum may be earned in a respectable place by artificial flower makers, the average is certainly above 12*s.* a week; sometimes two young women working together make 30*s.* between them; sometimes a woman with a little girl to help makes 1*l.* and more without being more than 12 hours at work.

Our hours are from 9 a.m. to 9 p.m., but in the spring and autumn, for three or four months each time, they often work for an hour or hour and a half later than that. Those who are later have usually come latest. We have tried to enforce strict rules, but our good hands are all very independent, and as we had rather break our rules than lose them, the rules are disregarded. Very many will not come early whatever we say or do. They leave at 4 p.m. on Saturday. We used to pay on Friday nights, but found that so many never came on Saturday at all, that we gave it up.

Besides the hour for dinner and half hour for tea, they have ten minutes grace at the one and five minutes at the other. No doubt when we are busy the piece workers hurry over their meals; some will even eat their dinner at their work. We have a steam apparatus at which they can warm anything they like, so many prefer having their meals here to going home. Those who live far off, of course, do, and some live two or three miles away.

The younger ones have often to get up from their tables to fetch things, as you see; that is much better for them than having one to do all the errands for the whole room, as is sometimes the case; they can get a little exercise and stretch themselves.

The arrangements about waterclosets are too frequently neglected where young women work. I have heard many complain of other places where the smell from them has made the whole workroom offensive.

Flowers of the lowest class are frequently made at home; girls fetch from small men material for so many bunches, and are paid 2*s.* 6*d.*, 1*s.*, or 10*d.* a bunch, as the case may be; that is often hard work; as much can be earned at it perhaps as at better work, but they must work harder for it.

None of the six little girls under 13 have mothers or sisters working for us here. In some cases where I have wished such children to go home earlier than the older ones, they have told me that it was no use, for their mothers would not be in if they did, and they would have to wait outside the door.

It is more difficult than it used to be to get learners for artificial flower making; very many of the class that furnished them have now taken to the sewing machine, and though those are not perhaps the best of them, still that machine on the other hand requires a certain amount of intelligence, and so takes those who would be useful to us.

[16. The youngest employed here, a girl of 10, could not read, all the others of whom I inquired could. From the wage book which Mr. Botting showed me it appeared that many earned from 13*s.* to 16*s.* a week during the busy months; several earned more than that, some more than 20*s.*: the majority of the helpers were receiving from 2*s.* 6*d.* to 5*s.*]

17. MESSRS. FOSTER & DUNCUM, WIGMORE STREET.

In the factory 77 females are employed, most of them in making artificial flowers, a few also in making feathers, all being work of the best kind. 17 of these are under 18 years of age, the youngest two being between 12 and 13. None are taken under 12. None are resident. 11 males are also employed here, two of whom only are under 18.

The regular hours are considered to be from 9 a.m. to 9 p.m.; but for about six months out of the season they leave at 8 p.m., as also do all who earn less than 7*s.* a week, even in the season; the younger ones, those under 14, leave at tea time, 5 p.m. Half an hour is allowed for tea and an hour for dinner; and the one in each party (averaging five) who prepares the tea is allowed 10 minutes extra for preparing and 10 minutes for clearing it away. In the season, three or four years ago, the majority had stayed, for about six weeks, from 7 a.m. to 9 p.m., but there had not been such a pressure since that time. On Saturdays they leave in summer at 5 p.m., in winter at 4 p.m. The employment is constant, as stock can be made in the slack time.

The younger ones assist generally for the first three or six months, and after that time receive a small weekly salary, rising from 2*s.* 6*d.* to 4*s.* and 5*s.* All are believed to have had some education; several attend night school. The work is done in parties of from four to eight persons. From the wage book it appeared that the average earning of the older ones is from 12*s.* to 15*s.* a week; four of one party, in a week in February which I selected haphazard, earned respectively 25*s.*, 17*s.*, 15*s.*, 6*s.* They are paid by the week, and not by the piece. Many have been employed a very long time by the firm; one woman had been there nearly 40 years.

Mr. Bannister informed me that the use of emerald or arsenic green had now almost wholly ceased throughout the trade; Messrs. Foster never use it in their factory.

MESSRS. MARTIN & CO., ARGYLE SQUARE, KING'S CROSS.

18. *Mr. Clitheroe* (Mr. Martin's partner), informed me, that the busy season in the artificial flower trade is from March to June, and from September to the 9th November. The older hands during those months come at 9 a.m. and go away at 10 p.m.; the younger ones, those under 13, who come to help some of the others, and are paid by them, always leave them at 8 p.m., their work being merely to carry things about, or to use a small goffering iron, and generally preparatory, so as not to require a longer attendance. None of any age had in the last 12 months stayed after 10 p.m.; and such occasions were rare at any time. Some, but very few, came in times of great pressure at 8 a.m. About 160 were employed on the premises,

there being seats for 180; besides these many outdoor hands had work given out to them, especially for violets.

Since the introduction of the sewing machine into general use more difficulty was found in procuring workpeople. A large percussion-cap factory was also said to have attracted many from artificial flower making.

Most of the work was to order, and not for stock. Out of the season the greater number of hands are still employed, but on short time, leaving at 4 and 5 p.m.

The little ones earned from 1*s.* 6*d.* to 4*s.*; one was only 10; another of 12 had been there a year.

MR. A. AUSTIN, SIDMOUTH STREET, GRAY'S INN ROAD.

At the time of my visit (July) about 40 females were employed here, the youngest being 10 years old.

19. *The Forewoman* told me that the usual number in the season was 60, and that for about three weeks twice a year as many as 70 work there. She pointed out to me that the fingers and thumbs of the children were frequently blistered from constantly using pincers or plyers to separate the cuts or layers of petals into the pieces of which they consist. Threading transparent beads on grass to look like dewdrops, which also was children's work, was mentioned as very trying to the eyes if done by gaslight. Some of the children went at 7 p.m. to evening school, when not working till 9 p.m.; they very rarely stayed later than that.

In accordance with the suggestions of several employers, evidence was taken by me, with the permission of Messrs. Eley, Brothers, at their Percussion Cap Factory, in Gray's Inn Road. The forewoman there stated to me that the four following witnesses were in her opinion trustworthy.—H.W.L.

20. *Agnes Hafferman* (Sept. 1864).—I was employed eight months ago at an artificial flower maker's in Goswell Road. I was there for one year. About 50 females worked there; 10 or 11 of them were under 13; none under 11; I was 19.

Our regular hours were from 9 to 9, but in the season they were always longer. I should say that for six months out of the year we worked from 7 a.m. to 10 p.m. every night but Saturday, and sometimes we began at 6, and even 5 a.m., and worked till 12 at night. I worked about two dozen times from 6 a.m. to 12 at night; the younger ones were not so long at work; they did not ever come before 7 a.m. nor stay after 11 p.m.; their usual time in the season was from 7 a.m. to 10 p.m. We left at 9 p.m. on Saturday, and sometimes earlier.

All but the learners were on piecework. I only did the best work, but I never earned more than 10*s.* a week even when I worked three nights a week from 6 a.m. till 12 at night. I worked all the night through once or twice. Once was a Friday night; I went on till 5 p.m. on the Saturday before I went home; another time was a Monday night, and then I worked on till 10 p.m. on the next day. We used to be very tired indeed with the work in the season; the constant sitting hurts the chest; but I don't find that I am any the worse for it now. Face-aches were very common among us; I still suffer from that, but I think not so much as I did. The percussion-cap work at Messrs. Eley's is much better than artificial flower making, for the hours are regular and not half as long, and we have work all the year round, instead of having nothing to do for five or six months out of the year and working very hard for the rest.

It was not our own choice to work so; we were not allowed to leave till we had finished our work. Our being on piecework made us, perhaps, ready to stop, but we could not go whenever we wished.

The young ones breakfasted before they came: we, who began at 6 a.m., often had nothing to eat till 11 a.m.; but we did generally breakfast at about 8 a.m. Half an hour was allowed for that, and for tea at 4; an hour for dinner at 1 p.m.; and if we worked late we took some supper at 9 or 10 p.m. We often worked through the meal times, but the children did not. I think most of us ate our meals at the table where we worked.

The dust of the green, and the blue too, was bad; it used to fly about and get on our hands when we had to separate the "pieces;" if we had a cut it made it sore; we used to tie a handkerchief over our mouths and noses, so that nothing got down our throats. We had nothing to do with preparing or putting on the colours; men did that. We used to draw the poison out of our hands with soap and sugar.

Our fingers often got cut by the silk and wire; I have known a girl ill for a fortnight through sores made by winding the stalks.

I have been at other flower makers; at one where I was for six months, three years ago, there were 40 at work; I was the youngest, and was 17 then. We never worked longer than from 8 to 8; but I was not there in their busiest time.

21. *Sarah Weston.*—I was for three years and a half at an artificial flower makers near Smithfield; I left only last Christmas. When I first went I was about 17; none were under 16; nearly 100 used to work there. We never went there before 9 a.m., and sometimes not till half-past 9; in the season, for two or three months each time, spring and autumn, we usually worked till 11 p.m. I never worked all the night; the latest was till 2 a.m.; that happened more than a dozen times in the year certainly; we were not allowed to leave before that time if they had work which they wanted to get done. We used to be told in the morning, when the work was given to us, that we should have to stay late; if we finished what they gave us by the usual time for leaving we had more given us. We were on piecework, but that made no difference; sometimes we used to ask to be allowed to stay so as to earn more, but if we had gone home at 9 or 10 p.m., when we were wanted to stay till 12 or 2 a.m., we should have been sent off altogether.

Some complained of their eyes, but mine never hurt me. There was no bead-work there; that must be very trying to the eyes. I used often to get sick and faint; many did. I left because of my health; I think it was the long hours, and not the work itself, nor the room that hurt me; the room was a good size, and we were not crowded. The dust of the blue and green are rather bad, but we had not much of either; the carmine is bad, too, but it is only when the dust gets on the chest. I don't know that it is poisonous. I find the difference in working here is very great; we work regularly for eight hours in the day, and that does me no harm.

22. *Annie Clarke.*—I went to an artificial flower-maker at 12 years of age, and stayed there seven years; I only left eight months ago. They never had more than 12 there; all but one would be more than 16 years old; there was always one learner there of 12 or 14, who prepared for some of the rest. All worked the same hours; in the season I often worked every night in the week from 7 a.m. to

11 p.m., but we always left off at 8 p.m. on Saturday. We worked till 2 a.m. six or seven times in the season, not more ; we frequently worked through the meal times, but the young one never did.

The dust of the green and blue used to give us cold, but the worst was the chest aching so with sitting and stooping all day. I certainly suffered very much in health, and am much better now that I work only eight hours regularly. I believe that all artificial flower girls have to find their own tools ; they are the goffering iron, cushion, pincers, and scissors.

23. *Mary Fisher.*—I went at 10 years old to artificial flower making ; there were 19 there ; some learners were younger than me, only 9 and 8 years old. We all worked from 8 a.m. to 10 p.m. on most days in the season but Saturday, then we left off at 6 p.m. Sometimes we had to work through our meal times ; that was seven or eight years ago.

Six months ago I was working at another place near Aldersgate Street ; 70 females were employed there ; 10 or 12 of them were under 13 ; they only worked from 9 to 9. For the first three months they receive 1*s.* a-week as learners ; at the end of 12 months they had 3*s.* a-week. Some might then begin piecework, but most would be learners for 18 months ; I was there for three years. We older ones worked an hour later than the learners, till 10 p.m. in the season ; we used to take work home as well, enough to last two hours ; you were always let do that, even the little ones took an hour or half an hour's work home. About a dozen times in the season we stayed till 12 at night, never later ; then we sometimes took work home, perhaps half an hour's work to do in the morning before breakfast.

It is a bad trade ; there is nothing to be earned in the slack times, which last for nearly half the year, and for the other half you work so hard that that hurts your health. I have not been made ill by it, but many are ; the chest is hurt by the stooping. I found the carmine dust, in opening the pieces, made me feel very heavy about the head ; the green and blue are less used.

The fingers are continually cut ; the forefinger by the silk, and the little finger by the wire, but that is not very bad.

I think the young ones go to some school generally in the slack season ; I have known some go away to school for a couple of hours in the day, and come back to work again.

I can tell you I like making percussion caps much better ; the hours are shorter, and the work better paid, and all the year round. I am quite happy at this work.

MR. ISAAC SAMUEL, RED CROSS STREET.

19 males and 50 females were employed here ; one girl was only 10, and had been two years at work. The rest were all over 13, there being 9 boys and 20 girls under 18.

24. *Mr. Samuel,* after taking me over his premises and observing that he had wondered that Government had not before instituted some inquiry into the employment of children in the artificial flower trade, referred me to the following witness for further details.

25. *Mrs. Paine.*—I am forewoman, and have been here 19 years. From 9 a.m. to 10 p.m., or, perhaps, 11, is the very latest for any here, and I always send the younger ones home soon after 9. Mr. Samuel is different from many employers in the trade, for employment here is constant for the whole year.

They leave off at 5 p.m. on Saturdays, and have several days holiday at Christmas, Easter, and Whitsuntide. They have an hour for dinner and a quarter of an hour grace besides. They go home if they please for that. Many of them have some lunch at 11 a.m. That and their tea at about 5 p.m. they take here.

All under 18 are on daywork, so we give them a kind of task. Some are very lazy, but others work well, and I think that the room, as a whole, does a fair amount of work between 9 and 9. A girl at 14, if she is industrious, receives 6*s.* 6*d.* or 7*s.* a week. All are employed directly by Mr. Samuel, and are not each attached to an older one as is often the case. Where that practice exists they are often very badly treated by those whom they help, like little slaves in fact. They are not, perhaps, actually knocked about and hurt much, but there are other ways of ill-treatment than using hands to them ; they nearly worry the lives out of them sometimes. It is at the best a very fidgetty work, and especially for young ones ; the mere sitting so long is tiring for children.

We sometimes have them here younger than they should be. Parents do not hesitate to say they are two or three years older than they are to get them taken on. There is no apprenticing ; they are paid something from the first. They all know the value of their earnings, and it is surprising to hear how they will drive a bargain when they come at 13 or 14, perhaps, to hire themselves.

I am sorry to say several of the younger ones here cannot even read. It is very sad to see their ignorance. Some of them do not even know their letters. The older ones can, most of them, read, but I recollect one young married woman of 24 who cannot. We have Sunday school teachers among them, and they sometimes give the others a little instruction. So far as my experience goes it is almost always the fault of the parents. I often overhear them talk of their homes and their fathers' habits. Some of the best educated are those who have had the greatest disadvantages, have, perhaps, lost their father, or have been of a large family.

The glass beads need not hurt their eyes. They don't take up one at a time but run the wire through a quantity of them. I always have them put on black paper by gaslight. The arsenic green is almost wholly disused now. When it is used it is for the leaves, and is never dusted on ; but is first mixed with gum and other things, and spread moist on the muslin before the leaf is stamped out. There is no dust then from opening the cuts as there is from the carmine or the blue.

[26. This appeared to be correct. I saw the process of preparing the muslin, and opened several "cuts" myself, using the same motion of the thumb as is used in opening a pack of cards, but could scarcely detect any dust at all, and none of a green colour.

27. I afterwards examined the wage books, from which it appeared that in the spring time two hours overtime, or work from 9 to 11 p.m. was not uncommon for five nights in the week, but I did not find any case of work beyond that time.—H.W.L.]

ST. MARY CHARTERHOUSE, NIGHT SCHOOL FOR GIRLS, GOLDEN LANE.

28. *A.*—Am 12 years old ; make flowers at a place where six others work. I am the youngest. We usually work from 8.30 a.m. to 7 p m. When we are slack we leave at 6 p.m., and when we are busy we stay till 10 p.m. I have often stayed till 10 p.m. twice a week for several weeks.

29. *B and C,* (two sisters.)—One began artificial flower making at 9 and the other at 10 years old. No other children worked where they did. They often worked from 7 a.m. to 9. p.m.

[30. Several others, aged from 10 to 14, gave similar accounts. About half of them worked at home.—H.W.L.]

Artificial Mourning Flower Makers.

London.

Mr. H. W. Lord.

m.

Central London Opthalmic Hospital, Gray's Inn Road.

31. *R. Taylor, Esq.*, F.R.C.S.—Artificial flower makers are frequently seen by me as patients at the hospital. They suffer in one of two ways; either from that form of weak sight known as *Asthenopia*, which is common to all employments in which the eyes are continuously and carefully used; or from chronic inflammation of the eyelids. I consider that this is caused by the dry colour dust which is used in certain processes of the trade, and which is conveyed to the eyes either directly by the fingers, or by floating in minute particles in the air. The girls themselves attribute it to this cause. The arsenite of copper used for the bright green of some leaves, grass, &c., is by far the most injurious; it is, perhaps, the only really injurious pigment, but I cannot speak certainly on this point. It is not so much used now as formerly, and it is some time since I have seen a case of the disease in question. This may be merely fortuitous, but the same remark has been made by my colleagues. I have never seen a severe case; the disease has always been readily amenable to treatment. Girls who work in a neighbouring percussion cap manufactory suffer in a similar way. I have often seen the particles of dust adhering to their eyelids. Mineral would probably be more deleterious than vegetable dust, but my attention has not been drawn to the distinction between the two kinds. I have consulted my colleagues on the subject, and find that their opinions and experience coincide with my own.

MOURNING FLOWERS.

32. Mr. William Towsey, Bunhill Row,

Informed me that he employed about 40 females in the manufacture of artificial mourning flowers of a superior class. None of them were under 13, and only three under 15; most were from about 16 to 20 years old. Their regular hours of work are from 9 a.m. to 8 p.m., but for about six months in the year they work till 10 p.m.; some rarely come before 10 a.m. They have an hour for dinner at 1 o'clock, and half an hour for tea 4.30 p.m. He added, "I find, say, 9 out of " 12 badly educated, can perhaps read a little, but not " write; and all of them have a very imperfect idea " of right and wrong. If they were taught by their " parents to believe in and to fear God in their infancy, " they would of their own accord try to improve their " education, and would be much better hands at their " trade, which requires some artistic taste. I cannot " procure sufficient hands who are respectably edu" cated, though it is a very pretty trade, and highly " paid."

He had always found that the steadiest and most industrious workwomen were those most respectably connected and best educated. He objected to employ or to allow his workwomen to bring little girls to learn their trade, as they would spoil their work. Children were employed upon goods of a commoner class than those which he made.

33. Mr. John Damon, Eagle Street, City Road.

I employ 17 females in making flowers of various kinds, not wholly mourning, though that is perhaps my chief business. I have four girls here who are about 10 years old, some a few months younger and some a few months older; seven more are between 13 and 18. Very few, if any, manufacturers of mourning flowers in London employ more than I do on my own premises; most is done by men at home with their wives and some children to help. In Manchester, and I believe in Nottingham too, many more young ones are collected to work in one building than is the case here; indeed they are able by that means to obtain their labour cheaper than we can, and so are supplanting us in the market for the common goods.

We work for six months from 9 a.m. to 9 p.m.; and for the other six from 9 a.m. to 6 p.m. An hour is allowed for dinner, and half an hour for tea. We are able to manufacture stock because our goods do not spoil as the coloured goods do if they are kept; we therefore have work throughout the year; and though there is a season, are not pressed to work too long in it.

There is nothing in our branch of the trade at all injurious to health, except so far as all sedentary occupations are necessarily so. For that reason I try, even when we are busy, to send the little ones home at 8 p.m. From 9 a.m. to 8 p.m. is quite long enough for a girl of 10. I engage them, though they are paid by those whom they help. They are not ill-treated, for I am always about, and would not allow it.

[One little one could not read.]

34. Mrs. Stowe, Penn Street, Bridport Place, Hoxton.

I employ only six persons besides my own daughter, who is 13 years old; one of them is a girl of 13; another is 14½; the rest are all between 17 and 20. In busy times we have one or two more, but we are never more than 9 or 10 altogether.

Sometimes I have had learners as young as 11; one or two at a time; they help the older ones; 10 or 11 is a usual age for them to begin. They don't often stay after 8 p.m., and come between 9 and 10 a.m. Indeed many of them would be better off here of an evening than in their own homes, but their mothers wont let them stay late; 10 p.m. is our latest, but we do not work after 8 p.m. for more than about three or four months in the year, perhaps for six weeks at one time, and eight weeks at another, with a month or two of slack time between them.

They have very little learning among them when they begin so young. My husband used at one time to teach some of ours in the dinner hour; but he is too ill now; they might often go to evening school, and day school too, if their parents would send them.

It is a poor trade; any one can start as a crape flower maker who can buy a pair of scissors and some wire and some odds and ends of crape that would commonly be thrown away as rubbish; a guinea is a large capital to begin with. That's how it is that all the trade is in the hands of small people; scarce any employ more than we do, and most have less.

There is no profit to be made out of it; those that make it pay take something else in with it, coloured flowers, or crinoline, or fancy trimmings, but it is just two farthings for a halfpenny by itself, that is, when you've paid your hands and the gas in winter, when we have to light soon after 4 p.m.

Some will not come till 11 a.m., and then want to stay late, but we wont have that. Our extra hands are often with us only for a few days or a week or two, and then we don't want them any more, or they hear of some better work elsewhere, and so go off.

The black is not near so trying as white or red is to the eyes; they dazzle so. Sometimes we make loops of red chenille, but the white muslin is worst; I have known girls with their eyes nearly out of their sockets with making white flowers by gaslight in winter.

Artificial Flower Makers.

Manchester.

Mr. H. W. Lord.

m.

MANCHESTER.

Mr. Waterhouse, Halliwell Street (Feb. 1863.)

35. *Mr. J. C. Waterhouse.*—When I first began in this business 4½ years ago there were scarcely 50 persons in all Manchester who made artificial flowers, and now I have nearly twice that number myself; there are quite 300 now altogether, and will be more and more. These are chiefly makers of crape mourning flowers; the manufacture of coloured flowers is yet quite in its infancy here; still I have had some made, and so have one or two more. The hands here are not skilful enough as yet, but it is a mere matter of time.

I find that 33 of mine are under 13; the youngest three are between 9 and 10. The majority of them are between 10 and 15 years old; they have to be taught young. Many a girl of 14, with nimble well-taught fingers, gets through more work than one of 24. All are bound for two years; they are paid about 1*s.* 6*d.* a week for the first three or six months; then they will earn 2*s.* 6*d.* A good worker of 15 years old may get 8*s.* and more; we pay by the week, but according to the amount they can do in the hour.

I don't like very young ones; the long sitting to work in one room is bad for them, but their parents come and beg of me to take them; they have scarcely any education. The forewoman upstairs says, that of the 50 or so in her room there are not a dozen who can read.

36. *Elizabeth Pennington.*—Am 12. Began flower making at 9; used to work then from 8 a.m. to 8 p.m., the same as now; never longer. Never went to day school; go to Sunday school; don't know who St. Peter was. Have heard of Judas Iscariot; know what he did; he walked into the sea and was drowned.

[This witness could not read large print without spelling her words letter by letter. Mr. Waterhouse informed me that her parents were usually in work, earning 1*l.* a week, and more.]

37. *Isabella Maguire.*—Am going 13; haven't been to school so much; not to day school at all. Know where Dublin is, and Cork, because I have been there; don't know in what country Edinburgh is. Can read a bit.

[This witness was the daughter of the forewoman, who was in receipt of 16*s.* a week; her father was also earning fair wages as a tailor. She could only read letter by letter.]

38. *Sarah Smith.*—Don't know my birthday; mother says I am turned 10; have been at flower making about 16 months. Never went to any day school; can't read.

39. *Emma Thompson.*—Am 12; have been here three months; was at silk winding before at a Jew's in Nelson Street. Worked there from 6½ a.m. to 8½ p.m. every day. Had 1*s.* 6*d.* a week for it. Several other girls were there. The master has flitted from that; the bailiffs came; he gave me 2*s.* to tell nobody, and flitted off. I can't read; can multiply; twice 5 is 10; five times 4 is 16.

40. *Mr. Waterhouse* subsequently stated that in his opinion the cause of so many children being sent to work at a very early age, and without going to school even up to that time, was to be discovered in the dissolute or improvident habits of the fathers, and the great mismanagement of the mothers, rather than in the poverty, which was the general excuse for their neglect One among several instances which he gave me of those in his own employ was that of a girl aged 10, who had been for several months with him, and was unable to read. Her father was a gasfitter, who earned on an average 2*l.* a week. Her mother frequently "did "washing and charing." The family consisted of two or three children at most. No money was put by. So long as the father was in good work they lived on hot bread and butter at every meal. If he were slack of work for a week or two, the mother would come to ask for an advance on her child's wages.

41. On one occasion, several years ago, Mr. Waterhouse had had to keep his hands at work all night, in order to complete a sudden shipping order for one of his largest customers. The order was dispatched at 1 p.m. on the second day, by which time, he said, nearly all of them were asleep. On the following morning none came to work till 10 or 11 o'clock, and they were then fit for nothing. He considered that on the whole he had rather lost than gained by the transaction, and this determined him never to allow such a thing to occur a second time.

42. Miss Doherty, 1, Booth Street.

I have been for 12 years in this business in Manchester; there is much more done here in that line than there was when I first came, and it is still a growing trade. I should say between 200 and 300 persons will be working in it in the town, chiefly girls from 10 to 16 years old; five or six employers, including myself, will have from 12 to 20 hands, and a number more will have six or seven working for them. It is all hand work.

I consider 12 my proper number, but we are one or two short of that just now; and I have work enough for 18 and more. I have advertized for extra hands and shall have them in a day or two most likely.

I do not wish to take any under 10 years of age; that girl who told you that she was 10, and had been with me for 18 months, told me she was 10 when she first came. She certainly looks older now, but many of them are very stupid, and don't know their ages, as well as being uneducated.

Long hours are not kept in any trade in Manchester now I believe. Our hours are from 8½ a.m. to 7 p.m. The general hours in our trade here are 8½ a.m. to 8½ p.m. I think no one, not even those quite in a small way, who do the commonest flower work, begin earlier or go on later than that; they may perhaps take them rather younger, and of course will pay them less than we do, for ours is the highest class of work. My brother, who is a commercial traveller in this business, has often told me, that in London, though they do not take them quite so young, they work them much longer hours. There, too, they have the coloured flowers, which are very unhealthy to work on. None of that kind are made in Manchester.

A learner we pay 1*s.* a week; after a girl has been a year with us she earns about 2*s.* 6*d.*; at 15 they probably average 4*s.* 6*d.* The eldest in our shop, who is a married woman, earns 9*s.* in the hours of work here, and frequently 3*s.* or 4*s.* more by the work she takes home. The children take work home sometimes; they like to earn an extra 6*d.* or 8*d.* a week by half-an-hour or an hour's work after tea now and then. No work could be lighter for them; they sit at a table on which the small pieces of crape are spread out, of which they make the flowers; the youngest twist crape round the wire which is to form the stalk, and they get on from that to making this kind of bud, and so on. They change about a good deal from one employer to another, but generally remain in the trade. Many are very poor, children of widows, or orphans, and have had no chance of going to school.

[43. Of four to whom I spoke here, all under 13, two could not read, and one could not write, but could read a bit. The work is certainly light, and they seemed to take their time about it. The room, though small, was clean and not close.]

OSTRICH FEATHER MAKERS,

LONDON.

Ostrich Feather Makers.
London.
Mr. H.W. Lord.
m.

MESSRS. VYSE AND SON, WOOD STREET.

44. *Miss Donohue.*—I have now 39 girls under my management, they are all employed either in scraping or sewing feathers, and have constant employment. Only six are under 13; they often begin at 11 years old.

Our hours out of the season are from 9 a.m. to 6 p.m.; now (end of January) there is a little more to be done, so they stay till 7 p.m. We go on getting later and later now until the height of the season; that is the worst of the business, that it comes all at a rush; for two or nearly three months twice a year we are very busy, our hours are then on the average from 8 a.m. to 10 p.m.; we have on rare occasions worked from 7 a.m. to 11 p.m. The work certainly is very light, but, no doubt, for the little ones, at all events, the hours are very long. I must own that I do not like to say I can't get an order done, when it is brought me. I do like to do all there is to be done.

When I came here three years ago there were only 12 hands in the feather department. The feather business has certainly increased in the last 18 months, and there has been a scarcity of good hands; perhaps I have done all I could to "push" it. Whenever I can manage I send the little ones home earlier, but even I myself have felt too tired almost to walk to catch the last omnibus home. I try also to relieve the younger ones from the sedentary position by giving them errands to go on about the premises.

They do really keep their health very well. I assure you they never knock up, even in our busiest time; still I can't help thinking that it must tell on them sooner or later However everything here is in their favour, for the whole arrangements of the establishment are most excellent; they have a separate room in quite another part of the building for their meals, for which ample time is always allowed; their clothes are always taken care of and dried for them if they come wet. Now and then I have heard that some of them had left home without their breakfast. I have always then sent them in to the kitchen for a cup of tea or coffee and something to eat. I do not know if Mr. Vyse knows that I have done so, but I am sure he would approve of it if he did.

Last season this room was dreadfully warm; we are obliged to have a good light, and so in the autumn must burn gas a good deal, and yet from the nature of the work we cannot have the windows open much for fear of the blacks or damp spoiling the feathers. We have more room now, but shall probably have 18 or 20 usually in the room. The staircase which leads from this into the room above has no door, and there are only a few up there, so that we have some ventilation in that way.

They all, as you see, have chairs with backs instead of mere benches; that gives them a great rest. We have to teach them the work at first, but there is no apprenticing or premiums. I might, perhaps, get more hands when we are very busy, but I am very particular in choosing them, for one bad one will make so many go wrong that I don't like to have any whose character I don't know to be good. Several of those now here have been for some years with me; they have 2*s.* 6*d.* a week for the first six or nine months, and with their overtime earn 5*s.* and 6*s.* sometimes; they rise up to 10*s.* and 12*s.* by degrees, and then make with overtime 18*s.* and 19*s.* a week. All of them can read and most write, I believe; I know that by often giving them the written orders to work from.

45. *Rachel.*—Am 14; have been two years here; have worked for four days running from 8 a.m. to 11 p.m.; wasn't tired that I know of.

46. *Jessie.*—Am 19; have been five years at this work; was in —— Street before I came here; there were nearly 60 there; all girls of the same ages as we are; I was there for 15 months; we worked longer hours there than here; I worked for several weeks, day after day, from 9 a.m. to 12 at night; so did most of them; the youngest there got 2*s.* a week; they worked about the same as the rest. I like beginning early much better than working late; but I don't think we get very tired here.

> [47. Another girl of 15, who had been four years in the feather department, told me, as she was showing me the way to another room, that the long hours made her very tired. I am inclined to think that the others fancied that the forewoman would not like them to admit this. I am, however, quite sure that she only wished them to tell me the truth. —H.W.L.]

48. MR. SUGDEN, JUNR., ALDERMANBURY.

We employ girls to make up feathers; from 25 to 30 are on the premises; the youngest is past 13; the chief seasons are from March to May, and from September to November, perhaps 10 weeks each time; we give out work also.

Our usual hours are from 8.30 a.m. to 7.30 p.m.; for all after that they are paid overtime; they never work after 9 p.m.; the younger ones have 1*s.* 6*d.* a week at first, and are raised about a shilling a year; all are paid by the week; the older ones earn 14*s.* and 16*s.* We have flower hands also; they earn rather less, 12*s.* and 14*s.*; they are of a rather better class than the ordinary flower-making girls, and are chiefly employed in finishing and on the best work.

All are very careless of ventilation; they will have in the summer time a large fire in their room to cook their meals by, and no window open; one fainted away last season from that cause alone. I do not think that either feather or flower hands in city houses work longer than we as a rule, nor do they employ them younger; it is in the smaller places in outlying districts that children are employed, and for long hours.

> [49. The mother of one of the girls employed by Mr. Sugden, whom I met with when inquiring into another branch of trade, gave me a very similar account as to the hours of work, wages, &c., of her daughter. She however never allowed her to work after 7.30 p.m., as the girl was only 15, and she thought that working from 8.30 a.m. to 9 p.m. was too long for one of her age. The work had agreed with her daughter very well, and in the three years, during which she had been at the work, her health had not suffered at all.—H.W.L.]

ST. MARY'S CHARTERHOUSE NIGHT SCHOOL.

50. *A. K.*—Am 14; make feathers at a place near here; a good many work there; all are females, some younger than me; some look about 9 or 10 years old; I know some are under 12. I used to be a flower maker, and before that was an envelope folder; went to that at 10 years old; used to work there from 9 a.m. to 9 p.m.; have never worked longer than that anywhere.

Ostrich Feather Makers.

London.

MESSRS. DE PINNA, 42 & 76 FORE STREET.

62 persons were employed at the two houses; all but three were females; six being under 13, and 19 between 13 and 18. Of the three males, two were between 13 and 18.

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51. *Mr. De Pinna.*—Very few employ more than we do in the feather trade; most have only seven or eight hands working for them, and few of them are children. The mothers always make them out older than they are. We should prefer to have none under 16 years old. It is very different from the artificial flower trade. We should want seven or eight times as many hands as we have to turn out the amount of work we do, if we were in that trade. We hire and pay the children that work here; they have 3*s.* 6*d.* or 4*s.* 6*d.* a week. They help the older ones by preparing their work; what they do is chiefly clipping the feather or twisting it. The older ones are almost all on piece-work. Our latest time is 8 p. m., and they come at 9 a.m.; but some do not come till 10 a.m., and they often leave at 6 p.m. If we want more work, we allow them to take one or two dozen home to sew. They have an hour for dinner at 1, and more than half an hour for tea at between 4 and 5; they have that here, but go out for dinner.

52. MR. M. DE COSTA ANDRADE, WOOD STREET.

15 males and 24 females are employed here; none are under 13; 5 lads and 8 girls are under 18. The usual hours are from 8½ a.m. to 6½ p.m. with an hour for dinner and half an hour for tea. For four or five months in the year they stay till 7½ p.m., but not later.

LIVERPOOL.

53. MR. MUDIE, MOUNT PLEASANT.

Liverpool.

We employ about 12 young women in curling and mounting feathers. I and my wife do all the dyeing. We sometimes take girls as young as 12 and bind them for 3 years. They are of the same class as good milliners, and have 10*s.* or 12*s.* a week when on journey wage.

None sleep here. Our hours are from 8 a.m. to 6½ p.m. On Saturday they go at 1 p.m., and on Friday stay till 9 p.m. generally speaking.

There is one other feather dresser in Liverpool; he employs rather more persons than we, for he also makes military and funeral feathers; but men are employed to do that.

Artificial flowers are not made in Liverpool.

REPORT on BOOTMAKERS, TAILORS, HATTERS, GLOVERS, &c.—By Mr. H. W. LORD.

TO HER MAJESTY'S COMMISSIONERS.

Bootmakers, Tailors, Hatters, and Glovers, &c.

Mr. H. W. Lord.

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GENTLEMEN,

1. MY Report on the manufacture of wearing apparel, presented to you last year, was confined in its subject matter to female labour. In several of the branches of trade comprehended within the second part of that report, lads under 18 years of age are also employed in considerable numbers. (2nd Report, p. 83, C. 118.) The most important of these are boot and shoe makers, tailors, hatters, and glovers. Boys are also occasionally employed in particular departments of some of the other trades there noticed; as, for instance, in pressing crowns for bonnet-shapes, and in stamping out leather for belts and braces; but their occupation is so limited and their number so few, as to render any separate reference to them unnecessary. The state of their education is rather lower than that of the rest.

2. The following table of the four above-mentioned trades is derived from the Census returns for 1861:—

NUMBERS of MALES employed in London, and in England and Wales, as Bootmakers, Tailors, Hatters, Glovers.

——		Under 15.	15—20.	Above 20.
England and Wales -	Bootmakers - -	9,442	50,756	175,536
	Tailors - -	3,537	23,475	94,212
	Hatters - -	254	1,896	9,515
	Glovers - -	288	805	2,461
		13,521	76,932	281,724
London - - -	Bootmakers - -	1,004	7,594	28,891
	Tailors - -	375	4,151	20,292
	Hatters - -	61	524	2,497
	Glovers - -	3	87	313
		1,443	12,356	51,993
TOTAL in London and in England and Wales -		14,964	89,288	333,717

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3. In the course of collecting the evidence upon which my former Report was founded, I availed myself of the opportunities then afforded me for observing and procuring information as to the employment of boys in those trades. A considerable portion of the information so procured has been already printed in the evidence which accompanied that Report. I have subsequently received communications relating to my present subject from several of the employers in provincial towns, whose works I had before visited; these, together with the results of further enquiries, made by me personally in the metropolis and elsewhere, make up the evidence sent herewith.

4. In calling your attention, as I now propose to do more particularly, to the details of juvenile male labour in the trades above mentioned, I shall have occasion to refer to both the above-mentioned sources of my information.

BOOTMAKERS.

Age.

5. I have met with several cases of boys being employed to help rivetters in factories as young as 10 and even 9; the majority, however, do not work in large factories till they are nearly 11. Most boys who work either at home or for journeymen are not more than 10 at starting. Their work is usually the old stabbing, or closing, or stitch work at the seat, as opposed to the new methods of closing with the sewing machine, and "making" (putting the soles on) with rivets.

6. The manufacture of "ready made" boots and shoes in London is carried on for the most part in the neighbourhood of the Hackney and Bethnal Green Roads; boys here begin sometimes at eight years old to help their fathers at home; such is the case also at Leicester, Northampton, and Stafford (2nd Rep., pp. 168, 173, Nos. 322, 357); at the two former places some were even working for journeymen at 7 (*id.*, 318, 327). At Anstey, a village near Leicester, boys are said to have begun at 6 years old sandpapering or paring for a finisher (No. 26).

Number.

7. At some factories in Leicester and Northampton as many as 300 men and boys are employed; at one, even in London, there are as many as 200. These estimates include those employed in the warehouses, which usually form a portion of the same premises. In many cases, however, comparatively few are employed on the premises of the employer in any process of manufacture, a very common practice being to have the material cut out there, and distributed from time to time to the closer, the maker, or the finisher (journeymen working at home), each of whom completes his portion of the work, and in the first and second case returns it to the warehouse for re-distribution.

8. The finishing is almost invariably given out, not, however, in all cases to one man working with his family at home; the finishing of rivet work in Leicester, the home of that branch of the trade, is constantly done in places where from 10 to 20 work together, one-third of whom often are children under 13 (2nd. Rep., p. 167, No. 318.)

9. As in the case of "closing" the upper leathers with the sewing machines, so in the novel process of fastening the uppers to the soles by means of rivets, the employers have not yet determined as a body whether it is better to have their rivetters on their premises, or to let them take their work home. The former is the usual practice at Northampton, the latter is the more common in London, and it is said that the tendency in Leicester is in the direction of home work (No. 24); in London, however, a certain number of rivetters, from 12 to 30 men and boys, is still frequently to be found employed at the warehouse.

10. The combined effect of the introduction of the sewing machine for closing the uppers, and of the system of rivetting the soles on to them, has been to reduce considerably the number of those who follow the old craft of stitching at the seat or with the clamps. If the American machine* for sewing soles prove as economical in the long run as it certainly is ingenious as a scientific experiment, the large number of boys now engaged in rivetting will be materially reduced.

Hiring and wages.

11. Boys are seldom formally apprenticed now, except in the bespoke or retail trade, and even in that case it is to the working master of a small shop, or to the journeyman who works at home for a large shop, rather than to a master in a large way of business, that a boy or two is now and then bound. Some are in-door apprentices.

12. In wholesale houses lads are taken under a quasi apprenticeship to the employer to learn clicking or trenching, each a mode of cutting out the upper leathers; they receive from 10*s.* to 20*s.* a week, living at their own homes.

13. Journeymen in the sewn trade sometimes take learners under agreement for two or three years; but for rivetting so little teaching is needed that they are said to pick their boys up out of the streets; these, whether working at a factory or at the home of the man whom they help, are hired and paid by him.

14. Finishers also take boys under agreements for short periods, paying them from 3*s.* to 8*s.* and 9*s.* a week in London. Rivetters' boys get from 2*s.* 6*d.* to 5*s.* at "chamber work," but in factories as much sometimes as 8*s.* and 9*s.*

15. Boys of 11 at the wholesale sewn trade have worked 14 hours a day for 5*s.*, and one at 12 years old worked from 6 a.m. to 10 p.m. constantly for 7*s.* a week, nothing being given for overtime in that case.

16. Children who learn to "stab" at Northampton usually receive nothing for the first six months, and after that begin with 1*s.* or 1*s.* 6*d.* a week.

State of places of work.

17. The rooms where the clickers cut out material for uppers are, in most factories and workhouses, clean and light; in some recently erected they are even fairly ventilated. The rivetters are not so well off; their work-places, in London at all events, are frequently overcrowded and usually close and dirty. One, which the foreman assured me with pride was the best in London, contained 216 cubic feet of air per head and about 400 to each gas jet, and the contrivance for ventilation was of a very rude and ineffective character; yet, so far as my experience goes, the statement of the foreman was correct. The great heat of the gas is a constant source of complaint both in London and elsewhere (No. 422, p. 193, 2nd Report.) Some have erred on the side of excess in ventilation, and bronchitis has been attributed to draughts arising from the size and height of the workroom.

18. At the same time such places are usually very superior to any accommodation possessed by those

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* A patent of the Blake Boot and Shoe Machine Company. See Evid., Nos. 1, 2, 5.

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who take work out, whether they work at home, or, in the case of rivet work, in the rooms of middlemen who let benches to different journeymen. Their houses are described as "miserable hovels:" their workrooms as "dreadful places, underground kitchens." (Nos. 4, 13.) With finishers this is even worse than with the rivetters or the seatsmen, for the work is more dirty, and stoves or gas jets in which they heat their tools are constantly burning on the low table at which they work "packed as "close as they can sit." (2nd Report, Nos. 318, 319, 421, pp. 167, 193.)

Hours of work: 1. In factories.

19. The usual hours of work in London factories are from 8 a.m. to 7 or 8 p.m., with an hour for dinner; these are, however, frequently exceeded in the busy season to the extent of from two to four hours, and for periods of from three to six months in the year altogether. The summer is the busy season. Mr. Pocock states their hours for the six summer months to be from 6 a.m. to 7 p.m. (No. 1.) Mr. Hickson considers their work to last from 7 a.m. to 9 p.m. for three months in summer (No. 5); while at Messrs. Homan's, after working four hours overtime for a fortnight shortly before my visit, the men themselves had applied to have it reduced to two hours, on the ground that such continuous protraction of work was too exhausting even for them, and it was believed that as much effective work could be got through after the reduction as before it. (No. 4.)

20. In large factories in Northampton the ordinary hours are 12 in the day, including an hour for dinner and a half hour for tea; in some cases an additional time is given for lunch in the morning. These hours are occasionally exceeded to the extent of two hours, but not altogether for longer than a month in the year. At similar places in Leicester the hours are from 8 a.m. to 8 p.m. in winter; from 6 a.m. to 6.30 p.m. in summer, with an hour and a half for meals; here also there is an occasional excess of one or even two hours, but it is an unusual thing for the work to reach two hours overtime every night in a week; the same may be said of Stafford.

2. "Garret" and home work.

21. Whatever work is taken out to the home of the journeyman, or to the small workshop where three or four of such men with their boys work together, more or less irregularity in habits and hours of work is an invariable characteristic; the early part of the week being wasted, and the fair work of six days being crowded into three or four. This remark is equally applicable to the wholesale and to the retail, to the London and to the provincial trade.

22. One lad states his hours, at 12 years old, to have been usually from 7 a.m. to 8 p.m., but once or twice a week from 6 a.m. to 10 p.m. when busy; he was then working for a journeyman in the east of London. (No. 3.) Another had worked, under similar circumstances, from 7 a.m. to 10 and 11 p.m. very often (No. 15), and a third from 6 a.m. to 10 p.m. constantly (No. 14); the last-mentioned often began to work at midnight on Sunday. The same witness states it to be a common practice for those who make cheap common goods in that district to work through Sunday, and adds, in despair of giving me any more exact account, "to such work there is no end and no beginning."

23. These are instances of "stitch" work; rivetters are said not to work so long, and this to some extent is true; at the same time one witness has frequently heard rivetters' boys say they were going to work all the night on Friday (No. 12), and another speaks of "some of them" working at home from 7 a.m. till 10 and 11 p.m. (No. 15.) It is worthy of remark, that one manufacturer gave up employing them on his premises because he "found that their habits were too strong" for him: "the "men would not come in to work till 11 or 12 in the morning, and would not leave till 11 or 12 at "night." (No. 11.)

24. So it is stated that London may be taken as a type of Leicester in this respect. (No. 27.) There boys work frequently with the finishers, whom they help, from 6 a.m. to 9 p.m. "They cannot get to "our 'free classes,' and those that do, fall asleep from exhaustion." (No. 319 a, p. 167, 2nd Report.) Again, at Northampton, the finishers, makers, and closers, who take work out, waste the beginning of the week, and "work all manner of hours at the end." (No. 28.) And cases have been known, though they are rare, of children and all beginning at 4 a.m. and earlier on the Saturday, in order to leave off at 2 p.m., and not stopping for any meals till their 2 o'clock dinner. (2nd Report, p. 170, No. 328.) At Stafford, likewise, from 12 to 15 hours a day is the common time for boys of 10 to 12, who put the stitches in for the makers. (No. 30.)

3. Retail shops.

25. The ordinary hours for apprentices at small shops, both in town and country, in the retail trade are said to be from 6 a.m. to 8 p.m. in summer, and from 8 a.m. to 9 p.m. in winter (No. 20); these are, however, exceeded at all events in particular instances, while "there are plenty of boys working for "journeymen who go on for 16 hours a day." The young man, whose evidence I have just quoted, had learned to take snuff at 14 years old to keep himself awake. (No. 24.)

26. This witness considers 12 hours at the stitch work quite long enough for any one, "allowing an "hour for dinner out of that." Another very respectable man, in a small way of business (No. 19), thinks that even 12 hours is too much for a boy of 15, unless varied; while the opinion of a third is, that 13 hours, with one out of them for meals, cannot be too much for a boy of 14. (No. 23.) Another, in the London wholesale trade, thinks from 8 a.m. to 7 p.m. quite long enough. (No. 11.)

Holidays.

27. Work usually ceases on Saturday at 4 or 5 p.m. in London factories; in provincial towns at 2 p.m. In the retail trade Saturday is often the latest night of the week, but the apprentice is in that case more frequently employed in minding or serving in the shop than at the seat.

28. Christmas day and one or two days following are usually observed as holidays in factories; part or the whole of either Easter or Whit Monday, and sometimes of both, is also taken, and in most cases Good Friday.

Meal times.

29. In factories regular meal times are almost always observed; in home work with journeymen or small garret masters, as might be expected, there is often but a short time allowed, and the food is often taken at the work when there is any motive for haste. One witness mentions extreme cases of children working from 4 a.m. till 2 p.m. on Saturday without stopping for any meal. (2nd Report, p. 170, No. 328.) Another reckons an hour in all for the meals taken during the 13 working hours: "You "can just come down and take them, and go back to your work at once." (No. 19.)

Nature of occupation.

30. The clicker stands up at a table, using a round knife, with which he cuts uppers or linings from the piece of leather or "stuff," which is laid on "the board," a wooden slab, before him. In the wholesale trade thick leather for soles is most usually stamped out by a machine press, which is frequently worked by steam.

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31. Those who make up the material into the boot consist of three distinct classes, closers, makers, and finishers. The closer sews together and completes all the upper part of the boot, including the lining, tongue, side spring, &c. For all women's and children's boots, except the best "bespoke," and the very commonest kind, closing* is now done by the sewing machine, and therefore is in the hands of females. Boys however, as well as girls, are employed at small places to paste for fitters, and to tie the ends of the thread after machining. (2nd Report, p. 170, No. 328.) The machine is also used in the ready made trade for the lighter kind of men's boots; but heavy boots, and particularly Wellingtons and Bluchers, are still closed by hand. The closer sits in a low chair, the pieces to be joined are placed between the two arms of clamps, a kind of wooden forceps held between the knees with the butt end resting on the ground; the holes are then stabbed in rows with the awl, and the two threads tipped with bristles are drawn through in opposite directions—the familiar action of a cobbler sewing with both hands, elbows outward, the awl being retained in the right hand. I have met with more than one case of the loss of the left eye from an accidental blow inflicted by a fellow workman with an awl thus used. Mr. F. Bostock states that this was no uncommon thing, before the general use of the sewing machine, if the children who "stabbed" were too closely seated. (No. 321, p. 168, 2nd Report.) In another instance a boy put out his own eye through the awl flying up, as he was loosening a nail that fastened the sole to the last. (No. 15.)

32. The mode of "making," or putting the soles on to the uppers, was formerly similar to that above described, except that the soles and uppers had to be "lasted up," and, when fixed on the last, were held by the stirrup across the knee instead of between clamps. When soles are not rivetted, this is still the mode adopted. It is obviously much more laborious than closing, not only because of the greater thickness of the substance to be penetrated, but also because a lower stoop is necessary, and "in parts "of it they press the heel of the last right into the pit of the stomach." (No. 13.)

33. But in the wholesale trade rivetting has for the present to a very great extent supplanted the use of the awl and waxed thread of the cobbler in "making." The sole is now pricked with holes by means of a light machine worked in a very few cases by steam, but usually by the hand or foot of a lad or child. Into each hole a rivet or nail is hammered by the boy who helps the rivetter. When several rivetters work together, the room is fitted with long narrow tables like shop counters, which are divided into compartments called benches, each bench being long enough to admit of a man and a boy to stand side by side at work. In each bench are fixed two iron rods, upon which moveable iron lasts are placed. The man lasts up, or fits the material over one of these lasts, lightly tacking the sole to the upper leather, and then passes it on to the boy, who with an old file drives the nails into the holes made by the pricking machine, until they pierce the part of the upper leather placed in contact with the sole, and their points meeting the iron surface of the last turn so as to form a rivet. The boy's work is, in fact, in the words of a witness of the old sewn-work school, "more like carpentering than boot-"making." (No. 12.) The nails, which are of iron, or more often of brass, are for the sake of saving time held in the mouth, and presented by the tongue one by one on the under lip to the finger and thumb of the nailer.

34. From the maker the boot passes in its rough state to the finisher, who sits on a stool at a low table, having the boot either fastened on his knee by a strap which passes under his foot, or "stuck "up with one end on his thigh and the other against his chest," while he uses a burnishing iron with both hands. This is called "staking," and, though man's work, is often done by boys of 14. Younger boys rasp off the heads of the nails, rub with sand paper, and ink and scrape the bottoms of the soles. "Finishing," says Mr. Pocock, "is heavy work; it would be much less so, if they would use the "upright moveable lasts we have here, and stand up to the table, but the men who work at home do "not care to change." (No. 1, see 5, 8.)

35. In warehouses boys of 11 or 12 are employed to dust and clean the stock, to punch holes, and put eyelets and laces in, and on similar work.

Steam power.

36. At Mr. Crick's factory in Leicester, (No. 312, p. 166, 2nd Report,) steam power is used, not only for rolling leather and cutting or stamping out the soles, as is the case elsewhere, but also for pressing the nails into the heels, for pricking holes in the soles, and for cutting the metal sprigs or nails used in rivetting. The machine used for the last-named object is similar to that used for cutting bolts. I was informed that in the week preceding my visit 5,496 pairs of ladies' military heel boots were made on the premises. A few lads are employed in connexion with this machinery, but as a rule adult labour is chiefly used.

Effect of employment on physical condition.

37. The effect of the ordinary "sewn work" upon the health is acknowledged by all to be decidedly bad. At sewing, "a man for the first few years seems to become almost paralysed." (No. 5.) "Want of "air and exercise is the bad thing. I have myself often laid on my back after leaving the 'seat,' quite "unable to move." (No. 24.) "Most who have been brought up to that suffer from disease of the "chest or heart, for the work is sedentary, and they have to bend very much over it, and in parts of "it they press the heel of the last right in the pit of the stomach." (No. 13.)

38. In this respect the rivetter is far better off than the sewer, for he stands up to his work, and has the exercise of hammering. Several young men who had formerly been in the sewn work told me that their health had improved much since they had abandoned it for rivetting.

39. The habit of putting the brass nails into the mouth has been said to produce excoriations, and also disorders of the stomach. (No. 320, p. 168, 2nd Report.) Mr. Moore, the medical officer of health at Leicester, states the result of a special inquiry, made by him at my request, to be that "although many "cases of aphthæ and disorders of the digestive organs occurred, arising apparently from this practice, "he had heard of no cases of any very serious character." (No. 421, p. 193, 2nd Report.)

40. The noise made by the nailers in rivetting is very great. Dr. Faircloth, of Northampton, stated that this had in several cases led to nervous affections, where many were working in one room. (No. 422, p. 193, 2nd Report.) Indeed the greatness of the noise has in some cases driven the employers to cease to employ them them on the premises. (No. 1.)

41. The same evil that affects the closer or maker at sewn work exists to a more prejudicial extent in

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* "Closing" is in strictness "seam work," as opposed to "stabbing," which is "through and through" work upon a flat surface: both are done by the sewing machine and by the hand "closer" also.—H.W.L.

the case of the finisher by reason of the increased pollution of the atmosphere by the gas used for heating the tools. The pressure against the chest in "staking," which I have before described, is also very injurious. It is to be regretted that the men are not disposed to adopt the upright last in use at Messrs. Pocock's. This is set up on a rod fixed to a table, similarly to that used by rivetters, but having at the top an universal joint, so that the boot can be turned in any direction. The lad who was using this told me that, although he had been there only a few weeks, he found that standing was much better than sitting. (No. 3.)

Education.

42. The boys who assist rivetters in London, whether they work in factories or not, are very ignorant and uneducated. "The majority cannot read." (No. 9.) Even among those who might be supposed to be of a rather higher class, from the fact of their seeking work in the warehouse in preference to the rivetting shop, it is difficult to find any who can read and write properly when they are wanted. (No. 4.) The ignorance which prevails in the Hackney Road and Bethnal Green districts among the lads who work for the journeymen, whether in sewn or rivet work or in finishing, is spoken of as characteristic rather of the locality than of the trade. This may well be so, for it is now a matter within my own experience, that when the labour of a district goes on for the most part in the houses of the operatives, ignorance and disregard of education exist to a much greater extent than where the home and the work-place are totally distinct:—where the operatives meet for their daily labour in a factory, under a system of fixed hours, which controls their irregular habits, and if it admits of overwork, at least makes that also regular.

43. According to the statement of the foreman of a large London house, Messrs. Homan, the men themselves begin to appreciate this, and prefer to work in a factory where they are made regular in spite of themselves. (No. 4.)

44. As it is, not only children of 10 and 12 but well-grown lads of 15 and 16 are not able to read. "Why," said a finisher's lad who was intelligent enough to value the education that he did not possess, "I can't even read or write. I only know my letters; that is often so among shoemakers' boys, who "begin to work at home young, and go out soon to work for another man, as I did." (No. 3.) These remarks, however, do not apply to the apprentices in the retail trade, nor to those who, under articles or agreement, learn to "click" in the warehouses.

45. The state of education among the finishers at Leicester is very unsatisfactory. The "Minister to the "Poor," Mr. Dare, in his report for 1864 (p. 15), speaks of them as a class "amongst the most degraded of "the working population." In his report for the previous year he states that out of 18 boys of various ages from 13 to 17, attending free evening classes attached to the Domestic Mission, 14 were unable to read at all, and the remaining 4 could do so only very imperfectly; 12 of these had never been to any day school at all, and only one for so long as a year. Such is the state of 50 per cent. of those who attend. (No. 320, p. 168, 2nd Rep.) I believe that the manufacturers in that town feel this strongly. In my 2nd Report I drew your attention to the remarks of Mr. Walker (p. 92, C. 204). I now beg leave to note the readiness expressed by Mr. Crick, junior, to adopt any factory regulations which could be of general application. (2nd Rep., p. 167, No. 313.) And in conclusion I cite the words of another manufacturer, Mr. Charlesworth, with whom I have corresponded in relation to home work since my visit to Leicester: "I wish some method could be brought about which would reach the case, but, I "fear, nothing but a comprehensive, sound, and universal system of national education will approach "the evil. (No. 27.)

46. In Northampton, moreover, there seems to be a higher value set by the journeymen on education than in London or Leicester, and though one witness states that in the lower part of the town, where the largest amount of work is done, there is still dreadful ignorance and wretchedness, he considers the state of education in the town to be generally good. (No. 323, p. 169, 2nd Rep.) The master of the British Schools (No. 342, p. 170, 2nd Rep.,) at Northampton informed me that out of 300 boys on his books, with an average attendance of 240, there were 40 over 11 years of age, and 17 of them were children of shoemakers or closers. His experience affords another illustration of the fact, that when children leave school much earlier than they should, it is for home rather than for factory work.

47. It is gratifying to observe here that the introduction of the sewing machine for closing is recognized by the master as having had a directly appreciable effect upon education by enabling a large number of boys, who were before employed at "stabbing," to stay longer at school than they formerly did.

TAILORS.

Age.

48. Tailors' sons are said to commence to help their fathers at home as young as 10 and even 9 years of age; they are, however, seldom apprenticed before 14, and those who help the journeymen who take work home appear to be usually at least 13.

Number.

49. The number of lads being brought up to the trade is considered to be much smaller than it used to be. Various causes are assigned for this, the most prominent being the great and still increasing use of the sewing machine, which, as I have before observed (2nd Rep., p. 68, C. 6), has the effect of enabling females to do much work of a kind which formerly was too heavy for them. This, however, is as yet confined to the wholesale and ready-made houses. In first-class London houses it is very rare to find any under 18 years of age employed on the premises of the master tailor; occasionally a good workman is allowed by way of favour to bring his son to work at the board with him; the sons of master tailors also are apprenticed in London; but as a rule "West-end journeymen are made in the "country." (No. 35.) Tailors' work at the east end of London, which is nearly all given out, seems to be almost wholly done by women. One wholesale clothier stated to me that seven-eighths of those who work for him are females, and the rest male adults, who do the pressing and button-holing. (No. 43.)

50. It is probable that from this cause the numbers have diminished even since the last census; for there is no doubt that the sewing machine has in the interval become much more generally used. As a matter of fact, the lads whom I have found employed by tailors in London have been for the most part apprentices, one or at most two together, in small shops, and chiefly in the less central districts. Journeymen who take work home from West-end houses occasionally have an apprentice, but an intelligent member of that class stated to me that he did not know of any among his acquaintance who at that moment had one. (No. 36, and see Nos. 37, 39.)

51. A signal illustration of the decrease in numbers was furnished to me by the books kept at the workhouse of the parish of St. James', Piccadilly, a parish in which the mass of the West-end journeymen tailors reside; yet no lad had been bound to that trade in the 18 months preceding my inquiry. (No. 42.)

Hiring.

52. The system of apprenticing by formal indenture seems disappearing. I am unable to state whether the majority of those who are apprenticed live at their own homes or with their master; most who are apprenticed at small shops in the suburbs of London, live at the place of work. There are seldom more than one or two apprentices in one such shop at a time. In provincial towns some employers have three and even four apprentices, but all of these do not usually reside with their master. (Nos. 44, 45.) On the whole, most of the apprentices in provincial towns would seem to learn the business by working singly with a journeyman or a master in a small way of trade. (Nos. 47, 49.)

53. There seems to be a very general opinion among the men themselves that apprentices in the country are better off than those in London. They are said to learn the whole trade instead of only a portion of it; the tendency in London being to divide the labour, so that a man who makes coats forgets, if he ever learnt, how to make a pair of trousers. (Nos. 34, 41.)

Hours of work.

54. The hours of work in London shops in which apprentices are taken appear to be 13 a day, usually from 7 a.m. to 8 p.m., including an hour for dinner. An hour extra now and then on a push is the utmost overtime in such places; for the pressure of the London season does not touch them. The journeymen who take work home are affected by that season to an extent and for a period variously stated. One witness considers it to last only for eight weeks in May and June, and to be nothing like the dressmakers' season. (No. 31.) Others, who are perhaps more constantly brought into contact with the journeymen of the West-end, speak of work, and especially home work, for 15 and even 18 hours a day for several days in the week as still going on from April to July, and again from November to Christmas. "It is all a drive then." (No. 37.) And "the sons have to work as hard as the fathers while the work "lasts." (No. 31.) In some provincial towns the regular hours of work are 14 in the day, and where there are seasons of special pressure, as during term time at Cambridge, the men who work at home work almost day and night sometimes for a week together; whether the lads who work with them do so too, or only work for the less time mentioned by one witness, 5.30 a.m. to 9 p.m. (No. 47), will of course depend chiefly upon the character and habits of the master, but also on those of the apprentice and his parents, if he live with them.

55. Among such persons the irregular hours usually characteristic of home work are found to prevail, and, as might be expected, to arise from the two most common causes; one being the habit of the men to waste the early part of the week and work hard at the end; the other the practice of employers to avail themselves of that habitual irregularity when any extra work is wanted at a push, so that work goes on till 11 and 12 p.m. or 2 a.m., or as the usual phrase is, "all hours." (See Nos. 38, 39.)

56. This is universally allowed to be a bad system; "10 or 11 hours a day is quite enough for a growing boy," says one who has a son aged 15 working with him. (No. 36.) "I think," says another, who speaks with a vivid recollection of hard work, "it would be a good thing if all apprentices worked only "from 8 a.m. to 8 p.m. and had an hour for dinner out of that; it would be better for the lads and no "worse for the masters; but they are curious men, and think it does a boy no harm to work too hard "for half the year, if he is nearly idle for the other half." (No. 37.)

State of places of work.

57. Another reason for preferring a country apprenticeship appears to be, in many cases, the mode of life and state of work-place among the journeymen who take apprentices at the West-end. These are by all accounts wretched in the extreme. "The work at home," says one witness, "is very irregular, and "the work-places very unwholesome; the majority eat and sleep and cook and work in one room." (Nos. 31, 33.) "The stench," says another, "is enough to knock you down; you go to the door, "perhaps, and open it, but shudder to go further into the room. There are hundreds of such places "within five minutes' walk of this shop of mine." (No. 38, see 2nd Rep., p. 148, No. 221.) In such places several men often work together. In one case I found seven under one man, who took work out from a West-end house; these were all crowded together in one small attic in a back street near Golden Square. The owner of the room was very proud of the accommodation, saying, as he showed me in, that very few had a separate work-room thereabouts, but most used their living room for work and often for sleep too. Similarly the witness, whom I have already quoted (No. 36), told me without any hesitation, and apparently as a matter of course, that his apprentice, if he could get one, would sleep in the work-room.

58. You are already familiar with the account given by Dr. Ed. Smith* of the state of the shops in London, where tailors work on the premises of the employer. I have before stated that lads under 13 are as a rule not found there; but it is worthy of note that the general opinion in the trade is that, in London at all events, "from a sanitary point of view it is far better to work in shops than at home." (Nos. 31, 34, 38.)

59. In spite of the alleged superiority of work-rooms in the country, there is still great need for improvement even there. The following account of one is given by a witness who had worked in some of the best and some of the worst: "The really bad thing in our trade is the state of the workshops. At "one place where I worked the room was underground, and the heat of the stoves and stench of dung "and refuse from a neighbouring stableyard was quite sickening." (Nos. 44, 45.)

Nature of occupation.

60. For the first two or three years of their learning the trade the boys' work is limited to sewing of various kinds. Considerable manual strength is required in using the iron or goose for pressing; but I have not found that lads under 17 or 18 are commonly trusted to do that portion of the work. The work is essentally of a sedentary kind, and therefore productive of deficient respiration; at the same time the well-known attitude of tailors on the board is not, in Dr. Ed. Smith's opinion, productive, generally speaking, of roundness of the shoulders or contraction of the chest; he observes, however, that when such defects occur they are chiefly among the younger men, a remark with which my own less extensive observation as to lads fully coincides.

Effect of employment upon physical condition.

61. It is generally allowed that tailors are not healthy as a class, and the chief cause of this is generally

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* Sixth Report of Medical Officer of Privy Council, pp. 419–421.

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recognized to be the state of the work-places. "I am sure," says Mr. Wood, of Brighton, after commenting on the want of proper ventilation, and on the great heat caused by the stoves used for heating the irons, "I am sure parents make a great mistake, when they put delicate children to our business; "it requires, at all events under its present conditions, a strong constitution." (No. 44.)

62. The report of Dr. Edward Smith, to which I have before referred, necessarily contains observations upon this subject so much more valuable than my own, as to lead me to refer you at once to it for further information under this head. If any further comment upon his conclusions be required to extend the application of them with even greater propriety to the younger members of the trade, it is afforded by this simple statement of a witness, who had himself been in the trade many years:—"I have brought "up three of my sons to the trade; one has been killed by it, and the other two look as pale as can "be; they were not naturally unhealthy; they are quite different from two other sons of mine, one "of whom is with an upholsterer, and the other with a watchmaker in the town." (No. 45.)

Moral condition.

63. The number of young persons, with whom I have actually come into personal contact, has in this instance been so small that I am not warranted in drawing any general conclusion as to their moral state. The men whom I have met with seemed intelligent, and had all had an education of some sort. One witness remarks that the children who bring their fathers' work in speak of going to school in the day time. (No. 34.) Another, after stating that the children of journeymen begin at 11 or 12 years old to help their fathers, adds "they become sadly precocious, and many know at 15 things they had "better not know at 20." (No. 38.)

64. The large shops where the adult operatives work together are, however, invariably spoken of as being bad schools for the morals of the younger ones. The same remark would seem to be generally applicable, but I have not found it in any other trade so generally applied as in this.

HATTERS.

Age.

65. Boys are not usually employed by hatters before 11 or 12 years old. I have met with some who have begun at 10, one was only 9 when he began at a large factory (No. 64); but where boys of that age work is generally in small places or at home. Lads are not apprenticed till 15. At some places between one-fifth and one-sixth of the total number of males are under 18, but at others the proportion is considerably below this.

Number.

66. In houses under the Trade Union,—fair shops, as they are called,—the number of apprentices is limited; an employer of ten men may have two apprentices, and one for every ten beyond the first ten. The "foul shops," though not under that restriction, do not take many more. There are always some other younger boys, who assist the men or are in the warehouse.

67. At Messrs. Christy's factory at Stockport 170 males were employed at the time of my visit, out of whom 29 were between 13 and 18, and three were under 13. At their London factory there were thirty-six lads under 18, the youngest being about 13. At Mr. Eveleigh's, in Salford, on the other hand, only four were under 18 out of 124 males. The total number of persons of both sexes employed at the manufactory varies considerably both in London and in Lancashire, amounting in more than one case to over 300.

68. Work is in some cases given out to be done by small employers who have three or four journeymen. This, however, does not prevail to any considerable extent, and the tendency has for some years been in an opposite direction, though some suppose that a reaction is commencing. (Nos. 54, 63.) In Lancashire and Cheshire, where most of the felt hats are made, the process called planking, by which the fur is worked up into a consistent substance, is usually carried on in sheds attached to the houses of the workpeople. (No. 293, p. 162, 2nd Report.)

Hiring.

69. Lads are formally apprenticed to the employer to learn the business; after a time they frequently receive a proportionate part of their earnings. At Stockport and Oldham I found apprentices aged 17 receiving 26*s.* 6*d.*, and one 42*s.*, in one week.

Hiring and wages.

70. In most places there are several boys, each hired by five or six men together, to fetch and carry things which they require for their work, or for their meals, &c. These receive from 4*s.* and 5*s.* to 12*s.* a week, according to the number of men whom they serve; when they stay beyond the usual time they receive something more. There is often a lad of 15 or so, "stoker" for each "shop," who is paid by the men. Lads employed in the warehouse or stock-room, and where machinery is used to "blow" the fur for felt hats, are paid by the principal. The apprentices are commonly taken from boys who have been before employed about the place, either in the warehouse or by the men in the "shop."

Nature of occupation.

71. Boys in the warehouse sort and box the hats; those who help the men run about on various errands, clean their boots, and sometimes cook their dinners. Lads of 15 or 16 "stoke" the fires for the irons; some rather younger varnish the bodies of the hats. Others of 13 or 12, where machinery is used for blowing and carding fur, the modern substitute for the "bowing and basoning" of former days, "feed" the endless felt, which carries the fur to the centre of the machine where the fan works. The proper place of these is at a distance from any wheels or straps, yet they manage to "get their fingers squeezed," (No. 61): but I have not met with any serious accident connected with the use of steam power in this trade.

72. In my former Report (177 C., p. 89, 2nd Report) I described the operation of "planking;" it is all hand work, and consists in dipping the fur from time to time into a vat or "kettle" of hot liquid, and manipulating it afterwards, by a sort of rolling and kneading process, upon a sloping lip of the vat to full it. Boys of 12 and 13 are employed at home in planking; some even at 10.

73. In all branches of the hat manufacture the workman stands to his work. The only part of the usual work of an apprentice, whether in body making or in blocking, or finishing, which requires notice, is the use of the iron. Considerable strength was formerly needed for this, inasmuch as the weight of an adult's iron was 18 or 19 lbs., and that of an apprentice 16 lbs.; now, however, the general substitution of silk for beaver has led to irons of less weight being used, those in the hands of an apprentice not being more than 11 lbs. Even this causes no slight strain upon the wrist; for it is not, as is the case with a tailor's goose, pressed down on the material to be ironed, but is lightly passed over the surface of it, so as to relieve but very little the weight of the iron hanging from the hand.

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74. There is also often a stout lad of 16 or so to each "shop," who turns a wheel for polishing the hats, as any of the men require it; this is heavy work, but not necessarily continuous.

State of work-place.

75. The "shops," in which hatters work, are for the most part very close and badly ventilated; many are much overcrowded, especially in the busy time; some are extremely and unnecessarily dirty. Where open fires or stoves are used to heat the irons, the heat is very oppressive. A close kiln is used for this purpose in several places, and where, as at the Messrs. Christy's, this kiln is placed in an apartment quite distinct from the work-place, great relief is experienced. The men commonly work without coat or waistcoat, wearing a flannel Guernsey instead of a shirt. In some shops the thermometer stood at 90° with the windows open on one side of the room.

76. "Planking" is usually carried on in a shed attached to the workman's dwelling; this commonly has large openings on three sides, with sliding shutters. I met with one case in which a mere cellar was being used, the floor of which was five or six feet below the footway, with only a door and one small window open. The place was full of steam from the "kettle."

Hours of work.

77. The hours of work are less than they were 15 years ago; but apprentices still often work from 7 or 8 a.m. till 9 and 10 p.m. in the busy season; this is said to last in London for five months at the beginning of the year. For particular branches of trade September and October are also busy months. At some places work goes on till 11 and 12 at night, but it is said that the men who work so late are in the habit of beginning late in the day. The steady ones work from 8 a.m. to 10 p.m. In some well-regulated factories it is rare for the work to be prolonged beyond 13 hours a day in their busy time. The Messrs. Hall, who have within the last year reduced their hours of work to that limit, find more work done between the hours of 7 a.m. and 8 p.m. than when, as was the case in the year before, they kept the "shops" open two hours later. (Nos. 50, 51, 60.)

78. The younger boys, who are hired by the men, are said not to stay so late as the rest. One of 13 told me that the longest he had worked was from 7 a.m. to 8.15 p.m.; but another at the same place, who was then 15, had worked last year from 7 a.m. to 10 p.m. often in September and October. He "used to get very tired," but "never did much after 8 p.m. except clean their boots." (Nos. 57, 59, 64.)

79. The younger boys at Messrs. Christy's do not even in busy times stay after 7 p.m. There, however, the practice of men hiring boys does not exist. "Altogether it was a bad system," says their manager in London, "and we swept away the whole batch of them." (No. 61.)

80. On Saturdays work ceases at 4 p.m., and in some cases at 1 or 2 p.m., but in the busy time it usually goes on till 5 or 6 p.m.

Meal-times.

81. Dinner is generally taken on the premises, and frequently cooked there. I have seen good sized joints roasting at the fire under the superintendence of one of the boys, the dinner for his five or six masters. Day workers usually have a full hour. The time the piece workers take about the meal is left entirely in their own hands; and the time the boy has depends too commonly on the caprice of some of them. At many places a bad custom prevails of constantly sending out for beer, and this is unfortunately encouraged by a system of trade rules inflicting for numerous social and other delinquencies fines which are levied in that form.

Effect of employment on physical condition.

82. Hatters run a continual risk of injury to health from carelessness in leaving the overheated rooms in which they work, without putting on sufficient extra clothing. The boys particularly suffer from this, and find that the constant running about from the hot room into the cold air gives them colds. (No. 59.) They seem, however, to be healthy as a class, and enjoy at least one advantage over tailors and bootmakers, that their occupation is the reverse of sedentary.

Education.

83. Some of the boys who are hired by the men know little more than their letters. One of 13 could not read the words "image" and "saint;" another could only spell out monosyllables letter by letter; a third, aged 10, working with his father near Stockport, could not read at all, and had never been to school. The manager of Messrs. Townsend's factory in that town states the education of the younger ones to be neglected. On the whole, however, I have found hatters' boys superior in this respect to those in many other trades.

84. There are no doubt difficulties, as the Messrs. Hall point out with regret, in the way of a London employer who is anxious to promote the education of the children employed on his premises. (No. 53.) Their existence makes it a legitimate subject of congratulation to the Messrs. Christy (to whose care in this respect at Stockport I have before referred), that their London manager thinks he "can safely "say that everyone of the boys there can read and write tolerably" (No. 61), and that my examination of several of them bears out his assertion.

85. "What we want now," says Mr. Woodrow, of Oldham, after remarking on the great social improvement in that town within the last 25 years, "is some force from without to prevent any from being "employed who can't read and write, at all events, under a certain age. It would be the wisest and "finest thing the legislature could do." (No. 294, p. 162, 2nd Report.)

GLOVERS.

Age.

86. I found one or two boys under 9 years of age employed in glove factories and warehouses at Yeovil, but few begin before 10 years old.

Number.

87. The number of boys in the trade is small, there being only 1,093 under 20, according to the Census of 1861. At some factories there are as many as 30 boys aged from 10 to 13; Messrs. Dent, in Worcester, have considerably more, but the usual number is from 4 to 12. Boys are not engaged in home work.

Hiring and wages.

88. Lads are apprenticed in the cutting shop, to the employer, at 14. They live at their own homes, and receive about 2*s.* a week for the first year, and rise 6*d.* a year, but are often put upon a modified form of journey work at about 18. The men who work in the paring shop hire their helpers, unless they happen to bring their own children.

Nature of occupation.

89. The younger ones are in most cases, however, employed in the warehouse or "counting room," in various light occupations, such as using a hand press to put studs in, or to punch pieces for the thumbs, or making up the material, which has been cut out, into packets which are taken home to be sewn by females, or putting the gloves in boxes after they have been finished. A hand press, like that used

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in printing, is worked, sometimes by lads of 16, for stamping out the palm, back, and fingers in one piece. (See 179 C, p. 89, 2nd Report.)

90. A sharp instrument, like a quoit with a bar across the centre for a handle, is used in paring the skins, which are stretched on stakes set upright in the floor. This is heavy work, much too heavy for the boys of 10 and 12 years old, whom I saw at the work. Most, however, are put to this at 15 or 16. Paring, staking, and other processes in preparing the skins previous to cutting are carried on in comparatively few glove factories, and form a part rather of the curriers' than the glovers' business. Some employers confine their business to "finishing" the gloves for others, who have not room or appliances for that purpose on their own premises. They also employ young boys in warehouse work, and in rubbing the gloves with French chalk. Other employers "finish" for themselves.

State of place of work.

91. The heat of the finishing rooms is at times very great. The open stove, still commonly used to heat the iron hands on which the glove is stretched, is said to have made even a good sized room, of its kind, "so hot as to be unbearable," (No. 393, p. 179, 2nd Report, and 173 c, p. 89, *id.*); and some such rooms are very small and close.

Hours of work.

92. The usual hours at Yeovil for the younger boys in the warehouse are from 8 a.m. to 8 p.m. in winter; the work is in summer commenced an hour earlier, and on Saturday night they are often an hour or more later. (No. 379, p. 176, 2nd Report.) At Messrs. Dent's, at Worcester, the younger boys never stay after 7 p.m.; they come at 8 a.m. in winter and at 7 a.m. in summer, having in the latter case three quarters of an hour for breakfast at 8.30, besides the usual dinner hour at 1 p.m. Lads in the cutting shop work sometimes from 6 a.m. to 9 p.m. on Thursday and Friday, but leave off at 1 p.m. on Saturday. The work-rooms are usually open at 6 a.m. in summer, and the men and older boys often stay till 10 p.m., but so far as I can learn it is not common for the same persons to work from 6 a.m. to 10 p.m. for several days together; work from 6 a.m. to 8 p.m. is frequent. The hours in the paring shops are 12 or 13 in the day: here work ceases at 4 p.m. on Saturday; but in many cases the men are allowed to please themselves, and consequently the lads with them work late at the end of the week to make up time lost at the beginning.

Effects of employment on physical condition.

93. I am not aware of any ill effect produced upon the health of the boys by the nature of their occupation. They all stand to their work. Such physical illness as exists among the men seems attributable chiefly to their own irregular habits, many having at the week's end long hours of work, and more particularly to hasty meals and to drink, and to unwholesome dwellings and places of work.*

Moral condition.

94. These border closely upon moral defects, "love of dress, drink, and late hours of work in the factory " or at home, produce in the two sexes most lamentable results." (No. 387, p. 178, 2nd Report.)

Education.

95. In Worcester the state of education seems good. Messrs. Dent have a night-school of their own at which 70 or 80 attend. They also take no boys who have not been to school. (No. 393, p. 178, 2nd Report, and see No. 395.) Education is very much neglected at Yeovil. I have before remarked on the state of the girls; the boys seem but little better off. The highest class in the boys' national school contains 37, (the total number over 7 years old being 123),† and the average age of that class is 10 years, while at a neighbouring town, Sherburne, the average age of the first class is 13 years. The master of this school considers, and without doubt rightly, that the half-time system would be of great advantage to the place. (No. 386, p. 177, 2nd Report, and see Nos. 333, 385, *id.*) Here boys, anxious to learn, have to be admitted as young as 10 to a night-school held from 8 p.m. to 9.30 p.m., because they have no other opportunity, "and some great boys of 15 and 16 are unable to read." (No. 387, p. 177, 2nd Report.)

I have the honour, &c.,
H. W. LORD.

EVIDENCE.

BOOTMAKERS. (See also 2nd Report, App. pp. 164—175.)

Bootmakers.

Mr. H. W. Lord.

London.

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Wholesale.

LONDON.

1. MESSRS. POCOCK, BROTHERS, SOUTHWARK BRIDGE ROAD.

The boot and shoe trade is still in an unsettled state; formerly one man used to last and sew and finish, now the work is distributed among three men, and each confines himself to his own branch; in some kinds of work riveting has wholly supplanted sewing, and will in its turn very probably be knocked out by the new American sewing machine. That seems to work very well; the agent of the patentee, Mr. Bates, has set one up on our premises.

The public will always prefer sewn work to rivet work, if they can get it at nearly the same price; for the latter is less elastic, and moreover the leather is found to wear away faster than the nails.

Although the substitution of such machine work for riveting would dispense with the employment of boys as nailers, boys would still be wanted to fasten the channel over the stitch; that process is the same as that which is adopted for the ordinary sewn boot, except that a solution of india-rubber is used instead of glue or paste. The boy would put the solution in the channel with a small brush, hammer it over, and then rub it down. There is also a very useful machine for cutting the channel, and another for cutting welts. We use steam power for the machine with which we stamp or cut out the soles.

We have very few workmen on our premises except those who cut the tops out; that is usually the case with wholesale houses like our own; the material is cut out on the premises, tied up in bundles enough for so many pair together, and given out to those who work at home; one workman takes the tops; when they are returned, they, with the soles, are given to another, who returns the boot again with the sole on, but in an unfinished state, and that is taken out again to be "finished." We had at one time nearly 100 girls on our premises working with sewing machines at the uppers, but they are all now working at their own homes with the machines, for which they pay us a

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* See Dr. Greenhow's Report, 3rd Report of Medical Officer of Privy Council, p. 189.

† According to the Census for 1861 the population of Yeovil is 14,925, of whom 6,584 are males.

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small sum, 2*s.* 6*d.* a week or so. Similarly we had about 60 riveters at our old premises, but now they all work at home; one great reason for having them work off the premises is that the noise they make is so immense, even our customers objected to it.

The men who work at home have apprentices; some, who have what is called a good seat of work, may have two at a time; but few have more than one.

The hours of work with us are from 8 a.m. to 7 p.m. with an hour for dinner; on Saturday they leave at 5 p.m. From November to March is a flat time in the trade, but for six months or so in the summer they begin work at 6 a.m., they do not then work any later. The younger boys do not work that overtime.

Finishing is heavy work; it would be much less so if they would use the upright movable last we have here, and stand up to the table, but the men who work at home do not care to change.

We have a few boys here of about 14 years old who clean boots, punch the holes, and put the eyelets in; there is one of about the same age who is learning to cut out; he was employed here as the others first of all; he is not apprenticed; we do not apprentice any; he has been at the "board" about three months.

[2. The boy referred to told me he would be 15 next month, and had begun his work here at 12, up to which age he had been to school. The youngest of the other boys was between 13 and 14.

An intelligent workman, who explained to me the principle of the new machine and showed it in work, informed me that, if worked by the treddle, it would turn out (*i.e.*, sew the uppers on to the soles) 200 pair in a day of 10 hours; and 300, if worked by steam.

The foreman of the department where the material was given out to the riveters stated to me that a man working by himself would last up and rivet a dozen pairs in a day of 10 hours, and a dozen and a half if he had a boy to nail for him.—H. W. L.]

3. *The lad "finishing" at the sewing machine.*—I am 15; I began to work at 8 years old, helping my father at home, just waxing the thread and so on, that was easy work and easy hours; at 12 I went to work for another man who takes out work from here; I was the only one there; my usual hours were from 7 a.m. to 8 p.m., an hour for dinner and half-an-hour for tea, but I have worked with him when we were busy once or twice a week from 6 a.m. to 10 p.m. This standing to finish is very much better than sitting; I have only been here a few weeks; before that I used always to have to sit; you sit on a low stool, and either have the boot fastened on your knee by a strap passing under your foot or stick the boot up with one end on your thigh and the other against your chest; that hurts your chest very much.

I hadn't much time for schooling; boys that work in that way very seldom do get much; why I can't even read or write! I only know my letters; that is often so among shoemakers' boys, who begin to work at home young, and go out soon to work for another man alone as I did.

MESSRS. HOMAN, WORMWOOD STREET.

Part of the subjoined information was given me by Mr. Homan; but as the following witness, at his request, confirmed his statement, and in conducting me over the premises, gave me much additional evidence, I have retained the whole under one name.

4. *Mr. Walter* (foreman.)—About 200 men and boys are employed altogether on these premises, including the warehouse; some are "clickers" and "trenchers," others are "riveters." Our great factory is at Northampton, where, when it is finished, we shall employ 400 or 500. The tendency certainly is to collect men into shops for riveting, and pegging, which is the same sort of thing; there is, however, still a good bit of work done by riveters at home. There is no question that those who work in large shops are far better off; in the first place, the home-work is often done in miserable hovels; in the next place, men who work in large shops must be regular. The men are anxious in many cases to come out to work, because, as they say themselves, they are then obliged to be steady and regular; the fact is, they have not moral confidence in themselves. I consider the factory system a thousand to one preferable to the home system.

In some cases men with a little capital and a small workroom let riveters who take work out come to their workroom to do it; they let out a bench to each man. A bench consists of two lasts set up in a table side by side, one for the man and the other for his boy who nails for him. The finishing is all done at home.

Our usual hours are from 8 a.m. to 7 p.m., with an hour for dinner from 1 to 2. I think those hours are usual in the trade, but whether the small men are so regular will depend entirely on their habits; those that work at home are no doubt very irregular. We are liable to pressure now and then; for the last fortnight we have been working four hours overtime; but the men get fagged with it, and have asked for the future to knock off the two hours extra in the morning, and say they can get through nearly as much with two hours overtime as with four; so we shall try them. Our overtime amounts to about three months in the year, but not for more than a week or two continuously.

The nailers who work on our premises are hired by the riveters, who pay them from 5*s.* to 9*s.* a week; riveters themselves earn twice as much as they could as seats-men, 45*s.* and 50*s.* a week and more; none of these riveters' boys are under 14, I believe.

[The youngest I could find was 13.—H. W. L.]

Most of them are sons of shoemakers or riveters, but they are not working here with their fathers. A riveter must have a boy who can nail as fast as he can "last up;" neither must get a-head of the other.

There are boys of 15 and 16 years old among the clickers; they are not exactly apprentices, but are articled at about 16, and learn to cut out; they begin from 10*s.* a week or so, and rise up to 20*s.*

There are not more than 20 boys under 18 employed here in manufacturing, and none under 13; there is very little schooling in the trade, at all events among riveters and that class; but I think they have improved in appearance and manners since they came to work regularly on the premises.

Boys go to finishing at about the same age as they do to riveting, 14 or so.

[The general manager informed me that he found it difficult to find boys, even for the warehouse department, who could do more than read badly.—H. W. L.]

MESSRS. HICKSON & SONS, SMITHFIELD.

5. *Mr. Thomas Hickson,* who conducted me over the part of their premises where some "riveting" and "finishing" were being done, stated, that although they were slack at the present time (November), they had had as many as 90 men and boys employed there in the year, and would probably have as many when trade revived. He considered that few boys would be employed by riveters under 12

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years old, for the reason that younger boys would be likely to spoil the work, and thereby soon cost the men much more than the difference in the week's wage. None of those employed at the time of my visit appeared to be under 12. Most of the finishing in London is home-work, and, in Mr. Hickson's opinion, the tendency is for the riveting work also to be given out.

He informed me that nearly three-fourths of the riveting and finishing work in the trade was done in Leicester, from which town many of the riveters, and especially the finishers now working in London, had originally come. He thought it not impossible that the sewing machine would be substituted for riveting, as a patent was already in existence, and being tested for that purpose. In that event boys would not be needed as now to drive the nails; they might, however, be still employed to build the heels, and otherwise to assist the men in lasting up, but there would not be so many of them.

He had no doubt that riveting was a far more healthy employment than sewing, at which a man for the first few years seemed to become almost paralyzed. He considered also that "finishing" was very heavy work, especially the "staking" (in which a man takes the boot in his lap, and presses it against his chest while he uses the iron with both hands).

The usual hours of work are from 8 a.m. to 7 p.m.; the overtime is optional, the doors being open at 7 a.m. and closed at 9 p.m.; such overtime lasts for three months in the summer, but the men cannot stand more than four or five such days in the week, though they prefer working hard for those days, and having one or two easy days in the week; they adopt, in fact, the principle of journeymen working as they do in their own homes.

6. *Phillips*, foreman of riveters, stated that the riveters' boys were as hardy and healthy a lot as any in any trade; several had begun to work there at 9 or 10 years old.

7. *One of the riveters* also told me that boys began at 9 or 10 to nail, and said that his own had done so.

8. *Sullivan*, a finisher, confirmed Mr. Hickson's statement as to the labour of "staking," and said that boys often had to do it as well as men, and worked as long. He had himself, some months ago, worked from 7 a.m., and sometimes 6 a.m. till 9 p.m. for five days in the week. The boy who was assisting him was 14 years old; he had begun the work at 12.

MESSRS. E. & A. LION, SMITHFIELD.

9. *The foreman* here informed me that about 16 boys were employed in riveting, &c., on the premises, but none of them were under 12 years old; they often began work at that age. He considered that they would not be put to it much younger anywhere, not even at home, as some strength was needed. Finishing was all done at home. That required an older and stronger lad. He stated, also that the majority of riveters' boys could not even read, and were picked up out of the streets or anywhere.

10. *The Messrs. Lion* informed me that they dislike any overtime. The hours of work on their premises are from 8 a.m. to 7 p.m., and they have rarely had more than half an hour overtime on any night in the last seven years.

11. MR. S. SIMON, TUILLERIE STREET, HACKNEY ROAD.

I manufacture for the wholesale and the ready-made trade. At one time I employed a large number of persons on my own premises, but now I give most of my work out, and have here only the clickers, (who cut out for the uppers), and a few girls who work sewing machines. I had nearly 100 girls employed here, but the greater part of them prefer to work at home, for there is a sewing machine in many families now.

There are some few boys, apprentices, who work with the clickers. Their hours are from 8 a.m. to 7 p.m. with us, and that is long enough. In my opinion overtime is unprofitable, as well as injurious to health.

Where boys are chiefly employed in the boot and shoe trade is among the riveters. A riveter has two boys of 12 or 14, who drive the nails in the holes which he makes; they also file the heads down. He pays them from 2*s*. 6*d*. to 5*s*. a week. It is among them that the habit of late hours of work prevails; it is nearly all home work. I tried having them here, but found that their habits were too strong for me. The men would not come in to work till 11 or 12 in the morning, and would not leave till 11 or 12 at night; so I gave that up.

But those are their habits at home, and frequently there is nothing done on the Monday and Tuesday, and consequently they work very hard at the end of the week, the boys working the same hours that the men do, for they must go on together. It is wholly unnecessary. If they choose to work regularly from 8 a.m. to 7 p.m., for example, every day in the week, they could get though as much and probably much more, and with less effort. As it is, many don't come here to take their work out till midday nearly, and others not till 7 or 8 in the evening.

One marked effect of this substitution of riveting for sewing is the diminution in the number of boys who are put to learn sewing in the trade. The boy's work in riveting is less laborious and more quickly learnt, and they are better paid, at first at all events, than they were at sewing, so that parents prefer to put them to that at once. In four or five years time there will be a great want of competent hands for sewing.

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12. *Mr. Newsom*, Thorold Square, Bethnal Green Road.—I take out work for Mr. Simon; I chiefly make ladies' in-door boots; they are scarcely ever riveted but are sewn. It is in riveting and finishing that most boys are employed: a boy will go to rivet at about 11 years old; his work is to drive the brass brads into holes round the soles; the holes have been made before by a pricking machine; the boot is put for riveting on to an iron last; the boy's work is indeed more like carpentering than boot-making, for the work is given out from the warehouse ready cut and they have only to hammer the brads in. A riveter must have one boy to help him, most have two boys. Boys are not put to finishing till about 15 years old; they then use the glazing iron, for riveted soles are mostly blackened and burnished. Finishers are a separate class from riveters.

I believe the usual hours for boys are from 7 a.m. to 8 p.m. with two hours for meals; that is so with me. I have sometimes had a boy to teach sewing, but have never kept one at work after 10 p.m. and not often so late: in sewing, the man has to fit the

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stuff for the boy to sew, and therefore often works later at night than the boy in preparing work for him to do the next morning. But riveters have not that to do;* so that when the man works late the boy does also, and that is the case often enough, especially where the first day or two of the week is wasted. I have often heard boys at the warehouse, who have come on Friday afternoon for grindery, say that they were going to work all night.

Where the work is done on the master's premises the usual hours are from 8 a.m. to 8 p.m. with an hour and a half for meals, and till 4 p.m. on Saturday; that was so where I worked, and is so in several places that I know of; but they are pushed from time to time and have to work longer. I know of one wholesale house at the present moment where all hands have been working more than a week past from 6 a.m. to 9 p.m.

Journeymen who take work out cannot always avoid working late; they often have to wait a long time before their work is given them; at one place I often waited more than two hours in the morning before I got the work, so that the boy is idle all that time and has to work late to make up for it: some boys are paid by the day and some by the piece, but it is the same in either case; if paid by the day the man must keep them to get the value of what he pays them in the day's work: if they are paid by the piece, they will work any hours, and will not stay where they are not kept going.

Some journeymen take boys to learn for two or three years, but that is at sewing, not riveting; I do not think they work very long hours, not longer than from 7 a.m. to 8 p.m. as a rule, but that of course depends upon the habits of the man, and all are liable to work late on a push to oblige the employer who gives them work out; such things are unavoidable.

13. Mr. T. H. Hooker, Bethnal Green Road.

Boys are employed by riveters as "nailers;" the men prepare the work for them, that is, fit it on the last; we have no boys here for that purpose, because our men do their own nailing. Most riveting is still done in shops though a great deal is done at home. The "sewn work" is much more injurious to health than riveting; most who have been brought up to that suffer from disease of the chest or heart; for the work is sedentary, and they have to bend very much over it, and in parts of it they press the heel of the last right into the pit of the stomach: some of the rooms where that work is done are dreadful places, underground kitchens, and so on. They are put to sewing at home as young as 8 or 9 years old; boys do not nail much before 12.

For almost all common work riveting has taken the place of sewing; the kind of work called "sew round," light French bottoms and the like, is nearly the only kind of common work that is not riveted.

The hours are much longer among sewers than among riveters; there is a great deal of work on Sunday; they prefer to have their Monday to themselves. You shall inquire of those whom I employ as to the hours of work.

There is very little education throughout this district; quite one-half of the boys who offer themselves to me as errand boys can neither read nor write; they are 13 or 14 years old. It is a constant complaint in the schools here that the children never stop long enough for the teaching to be of any use to them.

[Mr. Hooker conducted me over his premises and afterwards took me to the houses of several men who worked for him at their own houses; by this means I obtained the evidence of the three following witnesses. —H.W.L.]

14. — *Presser* (riveter). — Some short time ago I worked at a place, where the riveters had boys to nail for them, each had one; some were as young as 9 or 10, and very little; they had to stand on a high block in order to be able to reach the last. The hours were from 8 a.m. to 7 p.m. with an hour and half for meals. The boys' work is not continuous, for they play about, while the men are fitting for them.

As to home work there is no knowing how long they work: in the low common kind of work—among the German slipper makers, for instance,—there is no end to the work, and no beginning either; just as much on Sunday as on any other day; they often go on till 11 p.m.; sometimes they don't get home from the shop till dinner-time, and so don't begin to work till late, but the boys will be there in the morning.

I began at stitch work at 12 years old, and worked all hours, from 6 a.m. to 10 p.m. constantly; I was not with my father, but with a journeyman who had no one else. Afterwards I was at a Polish Jew's; I was 17 then, he had three men besides his own family. I wouldn't work on Sunday, but often began at 12 on Sunday night. The boys who work at small places like that or at home are from 10 to 16 years old. There is no regular agreement; they are generally paid by the week, when I was with my first master I had 7*s.* a week: no more however long I worked.

I have been at riveting for two years and a half; my health has been much better ever since; stitch work is very unhealthy. I am nearly 27 years old. So far as I know boys are employed as young and work as long now in the stitch work as I used to.

I have two brothers one 10 and the other 12 years old; neither of them can read: they work at a type foundry, often from 7 a.m. to 9 p.m.

15. *Boy at Clark's.*—I am 16; can't read; began work at 12 years old; was at school only for six months before that; have never been since; used to work then from 7 a.m. to 10 and 11 p.m. very often; that was stitch-work, they work just as long at it now, and so they do some of them at riveting. All sewn work is held across the knee by the stirrup. I lost my eye by trying to loosen the nail in the centre of a boot. My hand sprung up with the awl in it, and struck me in the eye.

[16. This boy's master told me that he had had several boys with him from time to time, and that none of them could read.—W. H. L.]

17. — *Butcher.*—Boys begin to stitch at home at 8 and 9 years old; they work any hours at that. They begin "finishing" at about 12 years old. First, they file, then ink and glaze. They earn about 3*s.* 2*d.* a week to begin with, and 8*s.* or 9*s.* at 14 or 15; but age has not much to do with it, for they get paid according to what they are worth, and a boy of 9 or 10, if he is quick and strong enough, will often earn more than one of 14.

18. Mr. F. D. Wrangham, Shoe Mercer, &c., London Wall.

I have inquired of four or five of my customers in the neighbourhood of the City Road and Whitechapel. Some of them employ as many as 40 men in riveting or finishing, all working at home, and many with a boy to help. They all tell me that the men whom they have asked assure them that they very rarely work longer than from 8 a.m. to 8 p.m. I have heard of only one exception, that is the case of a middleman, who has several men to do their work in his shop. These men and boys frequently work till 10 p.m., and in fact as long as they like. There are not many such middlemen.

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* This is inaccurate; the "fitting" of a riveter is, however, less carefully done; and the witness a superior workman of the "sewn" work, would not admit that to be properly called "fitting."—H. W. L.

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Retail.

I think that in the great bulk of the trade the usual hours are from 8 a.m. to 8 p.m., and are seldom exceeded, at this time of year at all events (November). So far as the sewn work is concerned, I think the whole trade would bear me out in saying that a man who works at home brings more work in in winter than in summer. They prefer the warmth of their own rooms then to the corners of the streets; and, being at home, may as well work as not.

19. *Mr. C. Parohl*, Malden Road, Haverstock Hill. —I have one apprentice. He has been a few months with me. I think a boy of 14 or 15 too young to sit at work all day; 12 hours a day would be too much, unless the work were varied. Such a boy ought to have more exercise. I send mine out on errands, and he also fetches water and things to assist about the house. At present his work is sewing uppers. He uses the clamps to hold them, and need not stoop to them; you must stoop in making the bottoms. There are many closers who can't make bottoms; in England that is generally so. I intend to teach this boy all the branches of the trade.

The hours of work are shorter in winter than in summer; we do not begin before 9 a.m.; we cannot use the wax for our thread until it gets warm. In the summer we begin at 7 or 6 a.m. sometimes. He always leaves off work at about 8 p.m., and then usually has supper, and goes to bed; but on Saturday night we have to keep the shop open late, and he has to help watch the goods there. We are often open till 11 p.m. then. I often am at work earlier and later than he is, if I have anything particular to do; but a boy of his age would not be able to help much in sewn work.

This rivet work is ruining the boys in the trade; for all they learn is driving the nails, and filing the roughness off. Finishing is bad work for health. My wife's nephew, and his wife, are in that. They often work from 4 a.m. till 11 p.m., and only earn about 23*s.* a week. It is all done at home. They sit close over the fire where the iron is warmed; and hurt their chests by pressing the heel of the boot against it in burnishing and filing. He wants to have a boy to help him, but I would not advise any to take up that work. It is a common practice for finishers to work all Sunday, and they are in the habit of drinking a great deal of beer to keep their spirits up; for the sitting all day in one close room is very depressing.

20. *Mr. Kislingbury*, Victoria Terrace, St. John's Wood.—I have two apprentices, but there are not so many taken as there used to be. You might go to a dozen shops like mine and not find one. Where they are taken they are bound at 14 for seven years, and live on the premises. There are never more than two or three at a time. They come chiefly from the parish schools or the workhouse; but most journeymen bootmakers have been taught by their fathers.

The ordinary hours for apprentices are from 6 a.m. to 8 p.m. in summer, and from 8 a.m. to 9 p.m. in winter, or thereabout.

21. *J. S.* (a tradesman in the London N.W. district.) —A bootmaker who lives next door to me has two or three apprentice boys. The way they are treated is shameful, for they work constantly from 6 or 7 a.m. till 9 and 10 p.m., and later. I have often seen them working till past midnight on Saturday. I can see them from the back of my house, for they work in a room that is built out into the garden. They scarcely ever get out of the house for any play or exercise. The youngest don't seem older than 12 or 13, but they may be small for their age; they certainly are not 18.

Cambridge.

CAMBRIDGE.

22. *Mr. Banham*, Junior, Green Street.— "Making," that is, putting the soles on, is much heavier work than closing. I was for two years learning the former, and, though I am tolerably strong, I could scarcely manage "making" the heavy boots, for there is much more labour required for thick walking boots than for dress boots for example; one of our men who makes dress boots, says, it is impossible for him to stand making heavy walking boots. Bristles are used with the thread as in closing, but the thread used in "making" is twenty times the thickness of the other.

We have lately found it difficult to get sufficient closers in proportion to the makers we employ, we have therefore had to press those of the latter whom we had. All the work is taken home. They do not work several together, but each man is either alone, or has a lad to help him; if the latter, he is called "double-handed." A closer will get through a pair a day by himself, and will earn from 25*s.* to 30*s.* a week; if he is "double-handed," he may earn from 35*s.* to 45*s.* a week, but that will be only in term time. In the four months of vacation he will not earn more than from 20 to 25*s.* a week.

I will take you to one of our closers who may be able to give you further information.

23. *Mr. Broom.*—I "close" for Mr. Banham. Boys come to work at about 13 or 14 years old; but there are very few now; not more than half a dozen boys closing in all the town. Parents won't put them to it now for fear of the sewing machines. Makers have more boys, but there not 50 lads altogether being brought up to the trade in Cambridge.

The usual way is for a man to work at home with one apprentice. They are bound for five or six years, and some live with their master and some at their own home. They are all, I think, fairly educated.

There is very little of long work, even in term time. I think 13 hours of work is a fair average; that does include meal times. About an hour is taken for them. Since the work is done at home, there is no time lost in going to and fro for meals, but when they are ready you can just come down and take them, and go back to your work at once.

I don't think 13 hours a day can be considered too much for a boy of 14. I used at that age to work from 6 a.m. to 9 p.m. I had an hour for dinner, but took my breakfast and tea at the seat. I was never better in health in all my life than then. I lived a mile from where I worked, and so had four miles walk in the day. Perhaps it was that that kept me well.

Brighton.

BRIGHTON.

24. *Mr. Tribe*, Over Street (journeyman with small shop).—I like regular hours myself, and think 12 hours a day quite long enough for any one to work, allowing an hour for dinner out of that. But there are plenty of boys working for journeymen in the boot trade who have to go on 16 hours a day. It is all bad management. Some of the fault is with the masters, who don't give out the work so soon as they might; but it is most the habits of the men, who choose to be idle for the first day or two in the week, and work on till 2 or 3 a.m. in the latter part. This is not peculiar to Brighton or to any other place, it is the same all over the country.

Boys are not usually apprenticed till 13 or 14, but many go much younger than that under a sort of agreement at about 10. This boy here is 12. He

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has been a year with me, but they begin younger than that. I began myself at 9. I did'nt work so very long at first for I was with a relation, but at 11 I used to work 14 hours a day for 5*s*. a week. Those are, in fact, the regular trade hours, 14 hours, with two hours out for meals. It is certainly too long for growing boys, particularly as they have to sit and stoop. Want of air and exercise is the bad thing. I have myself often laid on my back after leaving the "seat," quite unable to move. I learned to do this (showing a snuff-box), at 14 years old to keep myself awake at work.

[Besides the boy above mentioned there was a man and three lads, aged from about 17 to 21, working here. The latter confirmed Mr. Tribe's account from time to time as he was giving it me.—H. W. L.]

LEICESTER.

Leicester.

Wholesale.

R. Martin, Esq., of Anstey, near Leicester, has furnished me with the two following statements taken by him for me relating to children's work in outlying village districts.

25. *George Wolf*, of Anstey.—I put my son to the shoe trade at about 9 years old, but many children go younger than this. The youngest I have known is 8 years old.

He went to learn the sewing branch; that is the sewing by hand of the tops to the soles in the small light shoes; they are sewed on the wrong side, and turned.

He began by being paid 3*s*. a week, and was gradually raised. He afterwards went to the nailing branch, and at about 15, when out of his time, got 17*s*. a week.

Quite small children begin frequently by nailing; in this case the man, under whom they work, fixes the pieces, and they simply drive the nails.

They seem to suffer no harm in health, as they get a run at their meal times, (half an hour, an hour, and half an hour), but all nailers are subject to hurt from the brass sprigs which are almost always carried in the mouth; they generally take medicine for this about every other day. Some have tried to pick them up from the table instead, but they cannot work against the others, as they continue to turn them in the mouth, so that they all come out one way.

Children (boys), can also begin by boring the holes for the sprigs with a foot-stamping machine. Girls begin generally by pasting together the inside and top leathers temporarily ready for the sewing machines. They afterwards go on the sewing.

26. *Mr. William Moore*, shoemaker at Anstey, employing 200 hands.—I employ directly no boys under 12 or 14, or girls under 14 or 15, for they are too careless and idle generally when younger, but there are numbers of both sexes, who work under my hands at much younger ages. The boys begin about 6 or 7, and the girls about 5 or 6. The boys by working under a finisher generally (sand-papering or paring), and after that by going to the nailing while the soles are fixed and started by men. The girls begin by sewing the welting by hand, or by pasting the uppers ready for the sewing machine.

These go to the machine at about 15 or 16.

The people in my own factory work 10½ hours in a day; 6 to 6 in summer, half-past 8 to half past 8 in winter; with half an hour for breakfast, and an hour for dinner. They give up work always at 1 o'clock on Saturday, and often before. Those who work at their own houses of course work their own hours; they often work a whole night before the "feast" or Christmas.

I, who have done every branch of the work myself, consider it to be generally healthy, much more so than stocking making; for nearly all the branches stand up to work, and do not sit in a cramped position; except however the finishing, which is not very healthy; indeed, I found it affect my digestion when I worked at it.

The nailers do not carry brass sprigs in their mouths generally, for they are unhealthy, and also hurt the tongue from the roughness. They are paid rather higher for them in consequence.

LETTERS FROM EMPLOYERS.

27. LETTER from MR. CHARLESWORTH.

Stamford Street, Belvoir Street, Leicester,
December 13, 1864.

SIR,

REPLYING to yours of December 3rd, your London information is a type of the system here adopted. In the nailing department, it is not the general practice here to have one boy to one man, but it would take two or three boys to nail all one man could last. I may inform you that the riveting is now being given out to be done at their own homes, as the finishing is. It is daily becoming more the practice to give out, and not have them done on the manufacturing premises; in short I may tell you that it is my opinion the nailing will ultimately be done, as the finishing is, at the workmen's homes, or small shops of their own, as at Northampton, and county of Northampton.* If this becomes the rule, it would be a difficult task to give you any reliable data as to the ages of children when put to the shoe trade, or as to the hours they would work per day; perhaps, your experience will have taught you that when hands get from under factory management, and their time is their own, they, as a rule, are very irregular as to working hours. I am afraid the fact, as I have related to you, of their having the work at home, will render your task much more difficult. I wish some method could be brought about which would reach the case, but I fear nothing but a comprehensive sound and universal system of National Education will approach the evil. If, Sir, I can from time to time be of any service to you, do not be afraid to ask me for any information you may think I can furnish; for no man would more like to see the general improvement of the working classes than

Your humble servant,
WM. CHARLESWORTH.

28. LETTER from MR. J. B. SIMON (of Messrs. TURNER, BROTHERS, HYDE, and Co.)

Hardingstone, Northampton,
December 8, 1864.

DEAR SIR,

YOUR letter of the 6th instant reached me in due course. I have now much pleasure in answering the questions put therein.

Throughout the shoe trade boys work for riveters finishers, makers (by the latter I mean the men that sew the soles to the uppers of boots), and equally with females, for closers, that is hand, not machine closers.

The age at which they are first put to the work at the above-named occupations depends very much upon the size they are, but in 19 cases out of 20 it is from 11 to 13 years.

Riveting is chiefly carried on in the factories, but finishing and closing almost entirely at their own homes.

In the factories the average day is 12 hours, that is from 8 a.m. to 8 p.m., or in the summer from 6 a.m. to 6 p.m.

In their homes there is no stated time, generally the early part of the week is wasted, and towards the

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* *i.e.* As the closing, making, and finishing are done at Northampton; if it referred to riveting, this statement would be incorrect. See the two following letters.—H. W. L.

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close they are then obliged to work all manner of hours. It is not often the case in Northampton that overtime is made in the factories; but even when it is, it seldom exceeds two hours per day, and that for a period extending over the whole year of not more than a month in total duration.

Should you require any further information and details, it will always afford me the greatest pleasure to give or procure them for you, and I trust you will not permit any scruples to prevent you applying to me.

I am,
Yours faithfully,
J. Bruckshaw Simon.

29. Letter from Mr. Ager (Messrs. Ager and Milne).

Wholesale and Export Boot and
Shoe Manufactory,
Castle Street, Northampton,
December 31, 1864.

Sir,

Your letter of the 6th instant came while I was in Scotland, or would have been replied to earlier. In reference to your queries, closers employed in factories, whether large or small, work regular hours. A many of those who have work at their homes are not so regular; doing little at the beginning of the week, and keeping very close at the end. Riveting here is all done in large factories; 10 working hours is the rule in all of them; these are also the hours for closers in factories. Boys are employed mostly above 10 years old. Some of the makers, who work at home, are still very irregular. Drink is their besettment; such are often at the public house the whole week. I would say, though, the large majority of shoemakers are industrious and orderly.

I shall be very pleased to give you any other information you may require.

I am,
Your most obedient servant,
Thos. Ager.

30. Letter from Mr. Gibson (Messrs. Gibson and Woolley).

Sir,
Stafford, December 7, 1864.

Your letter of the 6th instant is to hand, and my reply is that it is usual for shoemakers to have lads who do the sewing part, or what they call "putting the stitches in." These lads are generally apprenticed, and their hours of labour are usually very long, say, from 12 to 15 hours per day, they begin the trade from the ages of 10 to 12 years. Their labour is altogether heavier than that of boys employed on the premises.

I remain,
Yours truly,
H. W. Lord, Esq. H. W. Gibson.

TAILORS. (See also 2nd Report, App. pp. 145—150.)

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Messrs. H. J. & D. Nicholl, Regent Street.

31. *Mr. Trelawney* (No. 221, p. 148, 2nd Report).—Very few lads under 18 are employed by tailors in any part of London, even in the suburbs; most of those under that age, who are in the trade there, are working for their fathers at home. Tailors' sons, however, are set to work very young, often at 10 years old; this is the case throughout the country, but especially in Ireland. The consequence is that at 15 they are put to man's work, though they are without strength for it; that is to say they become proficient at sewing, but have not the manual strength requisite for pressing and for working on heavy garments. Two young men here, who are 19 and 20 years old, began to work at home for their fathers at 9 or 10,* and were independent of him at 15.

Tailors are getting scarcer; the facilities of railroad and steam-boat travelling have encouraged emigration, particularly from Ireland, which used to supply the greater number. The system of apprenticing is wholly disappearing; and comparatively few are coming up to the trade. No lads but tailors' sons have for a long time applied to me to be taken on. The trouble of apprentices is disliked. My errand boy here, who is about 13, wants me to apprentice him; he can sew fairly already, but I shall not take him. It is in country-places for the most that any are now apprenticed to learn the business.

I know of the way in which work is done in the Whitechapel district, from conversation with men who have worked there rather than from my own experience; the system there is to have a few men to press, and any amount of women to work sewing machines. (See No. 43.) Machinery is changing the whole trade.

The work at home is very irregular and the workplaces very unwholesome; the majority eat and sleep and cook and work in one room. The sons have to work as hard as their fathers, while the work lasts; but there is plenty of slack time; there is no pressure with tailors to compare to that of dress-makers in the London season; it lasts at the most for eight weeks in the summer.† What hard work there is at home arises in this way; a man works for one or perhaps two shops; a coat is often sent in to him in the evening, and wanted the next day, perhaps at 4 p.m., so he and his son, if he has one to help him, may work half the night. From a sanitary point of view it is certainly far better to work in shops than at home; I believe it also to be to the interest of a master tailor. My system, that of having a number to work in one building, will be general in the trade in 20 years' time.

The best way for you to obtain further information will be to go into any respectable small shops in three or four districts away from the centre of London. Most of the proprietors of such shops are intelligent men; you will find that they will corroborate all I have told you.

Messrs. Grosjean and Petherick, Regent Street.

32. *Mr. Petherick.*—Very few lads under 18 are employed in our business any where in London, even including those who help their fathers at home; not one of the men who work for us have any. The parents here prefer them to be doing something at which they can earn money almost from the first, instead of having to support them wholly for a long time, or else to pay a premium with them; and in London there is plenty of other employment for them. I learnt in the country; the hours for apprentices there were from 6 a.m. to 8 p.m. An apprentice is put to sewing and basting for the first two years, and then learns to press and cut out.

Messrs. Mathison and Co., Conduit Street.

33. *Mr. Mathison.*—In first-class west end businesses no apprentices are taken except sons of master tailors, nor are there any employed under 18, unless as a rare favour a man is allowed to bring his son to work with

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* I learnt by inquiry of one of them that this was the case.—H. W. L.

† This witness had previously (2nd Report, p. 148, No. 221,) said that the longest hours in his room were from 8 a.m. to 11 p.m. in May and June, but that did not occur so often as three times a week.

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him; possibly a journeyman who takes work out from such places has one apprentice now and then; and small masters in the suburbs do so also; but the men who work in our shop and at houses like ours have for the most part learned their business in the country.

The hours in large shops are usually from 8 a.m. to 8 p.m.; in the season they work till 10 p.m. when there is any need, but very rarely later; those who work in the shop never take work home.

Some of my work is done out. A man working at home must often work from 6 a.m. to 9 p.m. and later too, and in wretched places; one who works for me has a wife and seven children, one of whom he is bringing up to the trade; they, I know, have but one room to work and eat and sleep in; that is no uncommon thing.

[Mr. Salaman of Charing Cross, Messrs. Scantlebury and Sharp of Regent Street, and Mr. A. W. Miles of Brook Street, Hanover Square, gave me similar information as to the practice of the trade in London and the small number of lads employed there.]

AT MR. CROOKES', 56, ST. JAMES STREET.

34. *Mr. Crookes, jun.*—We never take apprentices, but I have often heard our journeymen say that they worked twice as hard and earned twice as much when they were on half-earnings as apprentices as they do often now. If there are apprentices taken in London it will be by men whom we employ out of doors. Tailors are certainly not healthy men; they suffer from bad air, if they work in the small rooms of the journeymen, and perhaps as much from bad habits, if they go to the master's shop.

Since your last visit I have made inquiries of several of our best journeymen; they all confirm the information I gave you before, and say that they would not on any consideration apprentice their own sons to the trade in London; as they think that the places where they would have to work are very bad for the health.

The general custom is for all the men who work in the same premises to be drawn from one house of call; this gives great power to the men, who can always act in concert: many of the best men will not belong to a house of call, and so are driven to work at home. It often happens too, that a journeyman who works in a shop wishes to make use of his children, who are growing up at home; he therefore prefers to take work home, if his employer will give it him. I think the children rarely begin to help till 13 or 14 years old; they would begin by sewing sleeve linings, and next fell the bottoms of trowsers, and then perhaps sew the padding of collars. Most of their children go to school, till they are about 12 years old, I think; they constantly bring their fathers' work in just at our foreman's dinner-time and say they have been to school in the morning, as a reason for not coming earlier.

One great reason for the fathers preferring to apprentice their sons in the country is that in London now a man makes only one garment, and knows nothing of any thing else: a short time ago, for example, when we were not very busy, one of our best coat hands who earns 6*s.* or 7*s.* a-day, thought he would like to try his hand at a pair of trowsers; it took him two days, and he made 5*s.* In the country, however, only a few would be employed at one place; the master sits on the board with the rest, and an apprentice learns the whole of his business.

35. — *Garford.*—West-end journeymen are made in the country; they come up to London at 19 or 20, and are taken as improvers for two years, receiving 5*s.* or 6*s.* a week and their board; even when boys are apprenticed in London they are seldom formally bound. Most of those who take out work from Mr. Crookes' employ only journeymen. One has a son 15 years old learning the business, he employs seven or eight men. One other, I believe, has an apprentice.

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36. *Mr. Anderson,* Mill Street.—I take out work from Mr. Crookes, of St. James's Street, and employ eight or nine journeymen on my own premises; I do not take apprentices; my own boy, who is 15 years old, works for me; he always leaves off at 8 p.m.; 10 or 11 hours a day is quite enough for a growing boy. It is very rare for any tailors in London to have apprentices; you never find them in the large shops of master tailors, but occasionally a man is allowed to take his son there. I have a large acquaintance among men in my own position in this district, and do not know of one who has an apprentice. I once had two, whom I took out of charity to their mother, a widow. I had no indenture with them, and as soon as they were getting useful to me, they left to work for wages elsewhere. I should like to take an apprentice now, if I could meet with an honest respectable one; he would work the hours that my own son does; he would sleep in the work-room. No doubt the business is learned by journeymen tailors in the country; they come up to London before their time is out, expecting to earn 35*s.* to 40*s.* a week, and then find that they don't know their business. No doubt where journeymen, who work for master tailors, do take apprentices, the lads work the same hours as their masters, if they are unconscientious men. I knew a man who until lately had an apprentice; he was not at all a fit person for a boy to be with. I had rather not mention his name.

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37. *Mr. Burden,* King Street.—I work for myself, and have never had an apprentice; I was apprenticed in London, and worked hard; by hard, I mean 18 hours a day; I often did so, for I knew what I should get if I didn't—a good hiding. It is only for a part of the year that west-end tailors are very busy; that is, from the end of April to the middle of July, and from the beginning of November to Christmas; it is all a drive then; and they are slack enough for the other six months of the year. Where apprentices are still taken, they work as long as I used to, but there are much fewer, I am sure, than there used to be. The workhouses and reformatories may still apprentice boys to the trade, but I think that few parents care to do it. I have two boys, but I would sooner see them selling food on a barrow in the streets. Still so far as earning money goes, it is as good a trade as any, and in decent shops an apprentice would be tolerably comfortable; in the low back streets there is drunkenness and misery.

I think it would be a good thing if all apprentices worked only from 8 a.m. to 8.m., and had an hour for dinner out of that; it would be better for the lads, and no worse for the masters; but they are curious men, and think it does a boy no harm to work too hard for half the year, if he is nearly idle for the other half.

One way of accounting for there being fewer apprentices is that the wives and daughters of journeymen take the place of boys more than they used to do. Nearly all gentlemen's waistcoats, even for the best houses, are now made by women; and in the ready-made trade the sewing machines are commonly worked by women.

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38. *Mr. Leman*, Great Pulteney Street.—I have one apprentice; I got him from the parish, he has been here five months; I had one previously, who served his whole time with me; their hours of work are from 7 a.m. to 8 p.m.; it is only on an emergency that they ever work later. When I was an apprentice the hours were from 6 a.m. to 8 p.m.; as a young man after I married, I often worked from 5 a.m. to 11 p.m. I used to have at one time then a youth of 17 to help me; I lived in Greek Street, Soho, and he in Lambeth; he must often have left home soon after 4 a.m., and not got back till midnight. Such hours are not common among journeymen now, but still they work, as you may say, all hours, and seldom do anything on Monday. For instance, if I had more work than I could conveniently get through in time, I should not hesitate to send a coat out this morning to be finished by to-morrow morning; the journeyman who would do that might have a wife to help him, and they two would probably sit up till 2 a.m. over it. Instead of the wife it might be a son; more likely a son than an apprentice; their children begin to help at 11 or 12 years old; they become sadly precocious, and many know at 15, things they had better not know at 20. The rooms they work in are most unwholesome; the stench is enough to knock you down; you go to the door perhaps and open it, but shudder to go farther into the room; there are hundreds of such places within five minutes walk of this shop of mine. No doubt it would be the best thing possible for the health of men and boys too, if all were to work regular hours in large shops, but I do not know how that could be managed.

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39. *Mr. Jarvis*, Victoria Terrace, St. John's Wood.—In London only the journeymen and the small masters ever take apprentices, and not very many of them do; they have only one or two at most at a time. Since you ask me I must say I think apprentices to journeymen in London are to be pitied; for they have wretched rooms to work in and to live in; and often work very hard at the end of the week, because their masters do nothing at the beginning. I use to take out west-end work as a journeyman myself. I have not had any apprentices since I had a shop.

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40. *Apprentice* at Mr. Lenney's, Grosvenor Road, St. John's Wood.—I was apprenticed under a regular indenture at 15 years old; I live in the house. The hours I work are from 7 a.m. to 8 p.m., with an hour for dinner; sometimes I go on till 9 p.m. Those are the usual hours for apprentices in all the shops of small masters. They work as long when they first come, but are not kept to it so much at first. Most are bound at about 14 up to 21. They are worse off who are with men who take out work for the west-end houses, for their rooms are very bad, both for working and living; and they waste half the week, and so do double work for the rest of it; but in small shops like this the work is regular.

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41. *Mr. Merry*, Hampstead.—The usual hours in London are from 6 a.m. to 7 p.m.; where the shops are regulated by the houses of call they are never later, for overtime is not allowed; extra hands must be got if there is a press of work. The sweating work is usually taken by men who have run the gauntlet of all the good shops, so to speak, and are too disreputable to stop anywhere. Some apprentices live away from their masters: they have about 2*s.* a week at first. I was apprenticed in the country; the hours there are much about the same; that is much better for a lad than London. I never knew a London apprentice in our business good for anything; they do not even learn their work properly.

St. James's Workhouse, Poland Street.

42. *Mr. Tett*, who keeps the books relating to the boys apprenticed from the parish of St. James, Piccadilly, informed me that the last case of binding to a tailor was more than 18 months ago, in March 1863. During the current year (up to Nov. 10) nine parish apprentices had been bound, three of them to boot-makers. The average number of apprenticeships is from 9 to 12 in the year. The lads are seen from time to time by some of the parish authorities, but complaints of the length of hours of work are never made, and he believed that they rarely work more than 10 or 11 hours in the day. Separate sleeping accommodation is always insisted on for their apprentices, and great care taken in selecting proper persons as masters; they are never apprenticed to journeymen.

Messrs. R. and H. Parnall, Bishopsgate Street.

43. *Mr. Parnall* stated to me that all their work is given out to persons who work at home, or for middle men; of such persons quite seven-eighths are females, and the rest adult males, who "press" or sew button holes. This he considered to be the usual practice with wholesale clothiers.

BRIGHTON.

Brighton.

44. *Mr. Wood*, Western Road.—The usual hours for tailors in Brighton are from 7 a.m. to 8 p.m., with an hour for dinner; these are scarcely ever exceeded. Our season is for three months in the autumn and about four months in the spring; but if we are pressed, we can always give work out, or take strange hands on; there are always men to be got.

Some masters take apprentices, but none have more than three or four; some do not take any; I believe none are indoor apprentices. The worst part of the business is the state of the workshops; most of them are very ill ventilated, and from having the stoves in them, are very hot. I am sure parents make a great mistake, when they put delicate children to our business; it requires, at all events under its present conditions, a strong constitution.

The journeymen "sweaters," as they are called, sometimes have one apprentice or boy to sew for them; he often lives with his master. The habits of these men are frequently very irregular; the Monday and Tuesday of the week are wasted, and work goes on till 11 or 12 p.m. at the end. There are many things bad for young boys, no doubt, in that system.

Tailors.

Mr. H. W. Lord.

Brighton.

45. *Shopman* at Mr. Willard's, Western Road.—I have been in the trade many years, and have worked in many shops here and in Lewes, some of the best and some of the worst. The regular hours are 13 ; from 6 a.m. to 7 p.m., or from 8 a.m. to 9 p.m., with an hour for dinner. A master takes two or three apprentices at 14 years old for seven years ; work is very rarely longer than the 13 hours. Some of the journeymen who take work out have boys under an agreement ; their hours must depend upon the habits of the men.

The really bad thing in our trade is the state of the workshops ; at one place where I worked the room was underground, and the heat of the stoves, and stench of dung and refuse from a neighbouring stable-yard was quite sickening. I have brought three of my sons up to the trade ; one has been killed by it, and the other two look as pale as they can be ; they were not naturally unhealthy ; they are quite different from two other sons of mine, one of whom is with an upholsterer and the other with a watchmaker in the town : the latter does not make any part of the watch, but only cleans, or puts together parts that are made elsewhere.

LEWES.

Lewes.

46. *Mr. Whiteman*, High Street.—I have had great difficulty in getting apprentices : indeed, I have none now. My foreman tells me there is only one boy apprenticed to a tailor in Lewes ; they seem to prefer the printing offices ; I do not know the reason. I do not think sewing machines are much used in this town.

CAMBRIDGE.

Cambridge.

47. *Mr. Sabberton*, Sidney Street.—Boys are rarely employed in the shops of master tailors in Cambridge. The journeymen who take work out to their own homes have apprentices, but not more than one at a time ; it is not the habit for several such men to work together, but the man and his boy will be by themselves. The Cambridge journeymen are generally steady men, and it is much better both for the morals and the health of the boy to work in that way with one man, than to be in a workshop with 20 or 30.

> [Mr. Sabberton, junr., confirmed this remark from his own experience of the latter case.—H. W. L.]

These boys are usually apprenticed at 13 or 14 years old for four or five years ; if they live at their own home, a premium of about 10*l*. or so is paid, and after the first year they receive a small sum per week, beginning at about 1*s*. Some live with their masters.

The regular hours in the trade, when anything is going on, are from 6 a.m. to 8 p.m. ; in term time they not unfrequently work longer. I had men last week working for me almost night and day ; that was at their own homes. The apprentices in ordinary cases work as long as their masters, but not in extreme cases, as that I have just mentioned ; for work beyond the regular hours they are paid something extra.

I know of one man, a very respectable journeyman, who has two apprentices ; one has just gone to him, the other has been with him two years ; the latter has been working from about 5.30 a.m. to 8 and 9 p.m. in the last term or two ; that I should say is about the full extent of apprentices' work. The relations of these boys are connections of my own, so that I have special opportunities of knowing about them, but I hear a good deal about others also from time to time. The elder one has certainly not been injured by his work : indeed, his health has improved, and so have his manners.

MAIDSTONE.

Maidstone.

48. *Mr. Hills*, Week Street.—Journeyman tailors in this town work on the premises of the master tailor; they do not take work out. Very few lads are apprenticed to the trade now. I have 18 or 20 men usually working for me here. I have only one apprentice, and he is almost out of his time ; he is not an indoor apprentice, but lives at his own home ; that is usually the case, I believe, in Maidstone. The nominal hours are from 6 a.m. to 8 p.m., but the men are very irregular, and do not work so long as that unless we are busy ; occasionally in busy times some might come as early as 5 a.m., and some might work until 10 or 11 p.m. Our busy season begins at the end of March or early in April ; it depends on the weather. While we are busy, we cannot get enough hands for our work, but still lads seem to prefer to go to other trades. Apprentices will generally work as long as the men, but I should think it would be very exceptional for any to work later than 9 p.m., and that only occasionally, and not till they are 16 or 17 years old ; mine does not come till 8 a.m.

The custom formerly was to have an indoor apprentice, who had for the first year or two to clean the boots and knives, and do household work, and go on errands, but now a boy is usually kept for that purpose.

> [Mr. Hills' foreman and several of his workmen to whom I spoke confirmed this statement; they could not reckon up more than seven or eight apprentices in the town altogether.]

49. *Mr. Bridgland*, King Street.—I had not had any apprentices for six or seven years, until lately ; but I thought it would be well, if possible, to have some coming into the trade under my own eye. I now have one of about 16, and two older lads of 19 or 20, who are in fact improvers, and have already been for two or three years at the business with some small man in a neighbouring village. That is how tailors learn their trade now ; the number of lads coming into the trade is certainly smaller than it was ; and they are to be found in country villages, rather than in towns. A village tailor will rarely have more than one apprentice at a time.

The hours of work for apprentices are rarely more than from 7 a.m. to 8 p.m. I do not think that any respectable master would wish an apprentice to work longer than that, except under peculiar circumstances. I do not think apprentices are overworked at the present day ; not in places like Maidstone at all events.

> [Mr. Bridgland's shopman concurred in these remarks, and added that the number of tailors in England and Wales, according to the census, was one-tenth less in 1861 than in 1851, taking into account the increase of population. He stated also that he did not think there were more than a dozen lads apprenticed to tailors in Maidstone.]

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HATTERS. (See also 2nd Report, App. pp. 160—162.)

LONDON.

Messrs. Hall, Brothers, London Wall.

50. These gentlemen conducted me over the whole of the premises, and expressed themselves very decidedly in favour of reasonable hours of work and extended education. On the former point they stated that they had during the present year adopted a strict rule of closing at 8 p.m., the doors being opened at 7 a.m. In the previous year work had frequently gone on till 10 p.m., especially in the months of September and October (which with them, though not generally in the trade, were particularly busy months). They were, however, quite satisfied that they had got through more work in this year than they had before, and attributed it in the main to having got the men to be regular and to begin earlier, usually at 8 a.m., in place of working late.

51. Mr. S. Hall informed me that it was not uncommon 15 years ago for work to be continued till 11 and 12 p.m., and he had himself sometimes worked all night. It was then a rare thing for the wages to be paid till 8 p.m. on Saturday; such late hours, however, at all events so far as they were concerned, had ceased for years; and on Saturday they usually left at 4 p.m., or if very busy at 6 p.m. In respect of the Saturday there had been a general improvement thoughout the trade, and probably the hours were generally less than formerly.

52. There are 30 journeymen and five apprentices employed on the premises, the Messrs. Hall not being restricted as to the latter by the rules of the Trade Union. Apprentices are not taken until about 15 years old; as for a younger boy the weight of the iron (10 lbs.) on the wrist would be too much. There are also four or five boys who help the men, and are hired and paid by them; they fetch beer and food, and cook for them, empty the water away, and clean their boots, but do not assist in the manufacture otherwise than by fetching and carrying things.

53. Mr. S. Hall also informed me that they had a small library for the use of the workpeople. He and Mr. Hall senior observed that they would be very ready to adopt any general system of letting the boys leave earlier, at 6 p.m. for instance, to go to evening school, if that were thought desirable; but individually they had great difficulty in exercising any direct influence in that respect from the fact of the men and boys residing at long distances from the workshop, and in different parts of the metropolis.

54. Work is also given out to men who work exclusively for the Messrs. Hall, but in workshops of their own. Mr. R. Hall stated that the number of small men in the London trade working at home varied very much in a few years: it had been large some years ago, had of late been very small, but was in his opinion again increasing.

55. One lad of 16 is chiefly occupied in turning a large hand wheel for polishing the hats. One wheel does this work for all the journeymen, each hat taking about two minutes; it is heavy work, but not continuous; several men of whom I inquired, told me that they had not begun this work till 16 or 17 years of age.

56. The youngest boy was 11 years old, and he had been only a few months there. He told me that he had not ever worked longer than from 8 a.m. to 7 p.m. He had been to school before coming to work, and could read and write.

57. Another of them said that he was 13, and had been at Messrs. Hall's three months; his present hours were from 8 or 8½ a.m. to 7 p.m.; he had worked from 7 a.m. to 8.15 p.m. in the busy time, but never longer. He could only read letter by letter. He had begun at another hatter's at 10 years old, and had not worked there longer than here.

58. A third, "Jemmy," who was 14, had been 1½ years at work; from 8 a.m. to 8.45 p.m. was the longest time he had ever worked. He could read a little, but had to spell the words "saints" and "image" letter by letter. He had begun work at a cooper's at 10.

59. *Sidney.*—I am 16; have been apprenticed here two months; used to help the men before; began that two years ago; used to have 10*d.* a week from each man; that is 1*s.*, and 2*d.* off for stoking. I used to help a good many, and when I was 15 earned 12*s.* a week on the average, and when we were very busy 15*s.* We always leave off at 8 p.m. now. Last year I stopped till 10 p.m. sometimes, and began at 7 a.m. sometimes; I did so often in September and October, beginning at 7 a.m. and going on till 10 p.m. on the same day. I used to get very tired, but nothing more. I never did much after 8 p.m. except clean their boots. My health is very good. I used to find the constant running about from the hot room into the cold air give me colds, but that is all. Boys generally come to help the men at about 12 years old; Burgess was, and so was Webb (two whom I did not see.—H. W. L.)

[This lad seemed strong and healthy. Mr. S. Hall told me that he had wished to be apprenticed last year, but it was thought better to wait, as he was then not strong enough.]

60. — *London* (under foreman).—We certainly get more work done now we leave off regularly at 8 than when we went on till 10 p.m. They know they must leave then, and so come a little earlier, and work a little harder. There are two or three shops in London where they still work very late, till 11 and 12 p.m., but as a rule few are later than 10 or 10½ p.m., even when they are busy, and they work late because they will not come at a proper time in the morning.

Messrs. Christy & Co., Bermondsey Street.

61. *Mr. Thos. Williamson* (manager).—We have more than 300 persons of both sexes employed on these premises, about 35 or 36 of them are lads under 18; these are employed in various ways. There are four youths of 15 or 16, who are stokers, one for each room. The habit used to be for five or six men to hire a lad among them for this purpose and to go on errands for them; but they were being constantly sent to the public house, and altogether it was a bad system, so we swept away the whole batch of them.

There are four or five younger boys employed in sorting the hats and putting them in boxes, &c.; that

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is mere warehouse work. There are also four or five at the machines for "blowing" and "carding" the fur; they feed the endless felt with the fur, which is carried by it into the machine to be opened, the object being to let the coarse hair fall to the bottom.

These and the last-mentioned are the youngest we have. We profess to take none under 13, but now and then there are exceptions.

We do not apprentice any until they are 15 or 16.

I never have known any serious accident such as the breaking of a limb at our machinery. Sometimes a fresh boy gets his finger squeezed; there was one case of that kind last year, it was mere ignorance and curiosity that caused it, I suppose, for where he ought to be standing there are no wheels or straps near. I think all have very good health; the only possible injury would be from using the hot iron over the shellac, but I have never known any harm caused by it. The irons are much lighter than they used to be; formerly men's irons weighed 18 and 19 pounds, and apprentices' often 16 pounds, but now the heaviest are about 12 pounds weight, and most only 10 or 11.

The hours of work for the boys here are from 7 a.m. to 6 or 7 p.m.; they leave off at 2 p.m. on Saturday. For the first 5 months of the year we are very busy; they do not leave till 5 p.m. on Saturday then, and the journeymen stay till 9 p.m., so would probably an apprentice of 16 years old, but many do not begin work till 8 a.m. or later; the other boys do not stay after 7 even then. The hours in the trade generally are later than ours by an hour or two, but we find that both men and boys can get through enough work for themselves and for us, if they are properly looked after, with very little overtime, even when we are most busy.

The dinner hour is 1 o'clock. A bell rings for the day workers; they take their full hour; piece workers please themselves.

Where they have open fires for heating the irons, the rooms are very hot. We have one kiln which holds 74 irons in a separate room, so that the workshop is not affected. Men are more alive than they were to the importance of ventilation; but it is still difficult to make them understand its full value.

I may, I think, safely say that every one of the boys here can read and write tolerably, and most go to a place of worship and school on Sunday; we make a point of that as far as we can; only last week I refused to take a boy on who could not write legibly.

> [62. There are four boys who varnish the bodies; the youngest told me he was 14; he said that the smell made them feel sick for the first few days, but after that they did not notice it.
>
> The youngest in the machine room was a few weeks past 13; he told me he had been employed there for 17 months.
>
> The youngest apprentice told me he was nearly 16, and had been apprenticed for one year.—H. W. L.]

MESSRS. LINCOLN & BENNETT, NELSON SQUARE, BLACKFRIARS ROAD.

63. Mr. Bennett conducted me over the works, and gave me the following information:—

We are under the Trade Union rules, and therefore are limited in our number of apprentices; they allow two for ten men, and one for every ten beyond. We have six apprentices at present; the two youngest are 16 and 17 years old; they are not apprenticed before they are 15. The youngest on the premises are hired by the men themselves to fetch their work or their beer and meals, and generally to go on errands for them; they are paid 4*s.* or 5*s.* a week. They come at about 12 years old; there is only one younger; he is 11, and only one other as young as 12; there are eight of these altogether, four in the body shop, and four in the finishing shop; one of them is 16.

It is from among these that our errand boys and warehouse boys usually come, and from the latter we usually select our apprentices. There are six boys more in the warehouse; none younger than 16.

The men are all paid by the piece; they take their dinner on the premises. Our busy season is from February to June. From 8 a.m. to 9 p.m. is a fair average of our working hours. The men are later sometimes, but the boys would always go at 8 p.m., for as they do not assist in the manufacture, they are not wanted. We can work to stock, and so keep our men on all the year round; where that is not the case they close sometimes for two days in the week during the slack season.

Besides our men we employ when we are busy 60 or 70 females on the premises; of those we have now six are under 18.

Some years ago there were a good many middlemen in the trade; men that is who worked for large shops at their own houses, employing perhaps three or four others, but they are now pretty well abolished. The great rise in the price of materials has chiefly led to that. The price of calico for instance is double, and shellac, which used to cost 42*s.* per ton, is now 12*l.* I think there is nothing unwholesome in the business. When beaver hats were worn very much, more spirits of wine was used in it. Most of the irons also weigh only ten or eleven pounds now, and we heat ours in French kilns away from the shop, so that no open fires are needed. On the whole you may take ours to be a fair sample of the London trade.

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64. *Benson Perry.*—Am 10 years and 4 months old; work now at a bookbinder's; was at a hatter's in Southwark before I came here; was eight months there; went when I was nine; used to go of errands for the men; a good many worked there; usually worked from 8 a.m. to 7 p.m.; the longest was from 8 a.m. to 9 p.m.; did that every night but Saturday for four weeks together.

GLOVERS. (See 2nd Report, App. pp. 175—180.)

REPORT on PAPER MILLS.—By Mr. H. W. LORD.

To Her Majesty's Commissioners.

Paper Mills.

Mr. H.W.Lord.

O.

Gentlemen,—

1. The evidence, upon which this report is founded, relates, with one or two exceptions, to paper mills visited by me in Kent, Buckinghamshire, Hertfordshire, and other counties within 50 miles of London, and also in Lancashire. I have not been able to obtain any accurate estimate of the total number of persons engaged in this manufacture. The census returns for 1861 give only 16,195 males and females of all ages so employed in England and Wales, including London. Messrs. Grace of Newcastle, on the other hand, give 100,000 in round numbers as a fair estimate for, I presume, the United Kingdom. (No. 196.)

2. In order to arrive at a fair approximation, I consulted the Messrs. Balston of Maidstone, and went through the Papermakers' Directory for 1864 with them; the result was, that the number of employers in England and Wales appeared to be at the least 350, exclusive of those whose mills were still.* The 25 mills, from which I have received returns, show an average of over 180 persons to each mill, the numbers varying from 42 to 631. This average would give a total of 63,000, reckoning only one mill to each employer, whereas it is not uncommon for several to belong to one person or firm.

I.—Age, Sex, Number.

3. The age, sex, and relative number of children or of young persons employed in any given mill depend in a great measure on the kind of paper manufactured, and on the nature and quality of the materials used; although the habits of the population and the opportunities of other more lucrative or less laborious occupations in the immediate neighbourhood have probably a greater influence in this respect.

4. Persons of both sexes are employed in paper mills. Returns received from 25 show that out of a total of 4,642 as many as 2,454 are females, of whom 624 are under 18, 105 being under 13 years of age.

5. Children begin at 10 or 11 years of age. I found none under 8, and few between 8 and 9. In nearly all the mills visited by me, whatever the kind of paper manufactured, there were some boys under 13 years old; but only two or three had more than 12 such, and few more than 6.

6. Female children (under 13) are not usually employed in mills where straw, "esparto," or other grasses are used; nor, where brown paper and other wrapping paper, or mill boards, are made; nor, where—as is still the case with the best writing, account-book, and drawing paper—the paper is made by hand; unless indeed in any of the above instances paper of other kinds is also produced.

7. In the 25 paper mills above mentioned, 275 of those employed were children, and 721 young persons; so that about 6 per cent. are under 13, and 15½ per cent. between 13 and 18 years old.

II.—Hiring and Wages.

Hiring.

8. In "carded" mills, that is to say, where union men work, no boy is allowed to stay after the age of 15, unless he be apprenticed; by the trade rules one apprentice may be taken for each vat in hand mills, and for each machine in machine mills; one extra one being allowed for so many vats or machines. The number of apprentices in mills of the latter class is consequently much less in proportion to the total number of hands than in those of the former. At one mill in Maidstone, for example, where 382 persons were employed, there were 16 apprentices; at another in the same place, where 375 persons worked, the number of apprentices was only 3; the former being a hand, the latter a machine mill. The proprietors of this last-mentioned mill spoke very strongly of the bad results of this one-sided restriction in forcing them to have a constant succession of fresh boys passing through the mill so rapidly that no interest could be taken in them, instead of their growing up under the eye of the employer and remaining as journey hands when they had learned the trade. (No. 50.)

Wages.

9. The apprentice is always bound to the employer, but usually under a mere verbal agreement for 7 years from the age of 14. (Nos 62, 69.) He begins with 6*s.* a week or more, and rises up to 15*s.* or so, at 18 or 19. The rest of the young ones, by far the major part of those under 18, though not always in the first instance hired by the employer (No. 163), are always paid by him; in most cases, except the rag cutters, by time, receiving a weekly wage with extra payment for overtime.

10. Rag cutters are paid by the piece, the weekly earning of a child from 11 to 13 may be taken at about 4*s.*; that of a young woman of 16, 8*s.* They often purchase their knives of their employers for 1*s.* 6*d.*, which they pay back by deduction of 3*d.* a week from their wages. Some make their knives last 6 weeks, and some 6 months. Children who sort paper shavings are paid about 3*s.* a week. Slice boys, and the younger children of either sex in glazing rooms, earn from 4*s.* to 5*s.* a week; older ones from 7*s.* to 9*s.* The younger "catchers" at the cutting machines earn from 3*s.* to 5*s.*; at about 14 they receive 7*s.*; the children who help in the rag engine-houses are paid about the same amount as the younger catchers; boys of 15, who watch the machine and assist the machine men, often have 10*s.* a week or more.

11. The rate of wages varies with the district; the highest being probably that which prevails in Kent, and the lowest that in Buckinghamshire. It is needless to follow this matter out with exactness through all the details of the different occupations, or localities, which cause variations in the amount.

III.—State of Place of Work.

12. Some paper mills are very commodious, airy, and clean in all departments; even the dust of the "devils" being at all events reduced apparently to its minimum by means of fans, boxes, &c. Others,

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* In March 1865.

Heat of rooms.

O.

especially those of an older date, are very much the reverse; close, crowded, dirty, and hot; contrivances to get rid of the dust in the chopping rooms, or of the steam in the making rooms, being either wholly inefficient or wholly neglected. In several places, where news and other printing paper of a common kind was made, the dust was positively unbearable, the whole room being filled with a cloud so thick that I could scarcely see the features of a person 20 feet from me.

13. Many parts of a paper mill are necessarily very hot; this is the case particularly with the rooms in which the paper is made, or dried, or sized. In some, among the best specimens seen by me, the thermometer stood at 90°, and in hot weather at 100°, in the comparatively speaking cooler parts of the room. A boy aged 10 years and 10 months, who has to stay for 6 of his 12 hours "upstairs" (*i.e.* above the machine, where the paper passes over drying cylinders), describes his place as "precious hot." (No. 20.) So a girl of 16, who takes the sheets from the sizing trough, says she has been ill for a week, through the heat. (No. 128.) At one mill, where the larger sheets were delivered from the size bath on an endless felt through an upper floor into the "dry loft" (where the paper is hung in sheets to dry), the heat of that part of the loft, in which some young women were working, was excessive.

14. The difficulty of contriving a proper ventilation consists chiefly in the necessity of avoiding condensation of the steam, which both spoils the paper and renders the room clammy and miserable. (Nos. 54, 108, 122.) In the sizing room also, the size is very easily chilled, and thereby coagulated so as to become useless. (No. 70.)

15. Much, however, has been done by judicious building in the first place, and by the adoption of the up and down draught principle by means of louvres running the length of the roof (Nos. 6, 108) for the machine-room, and of a chimney ventilator on the same (Watson's) principle, or even the simplest form of a double hook inverted, in use at Mr. Joynson's (No. 5), for other rooms.

16. There is no reason, at all events in the nature of the work, why the rag cutting rooms should not be properly ventilated, and the remark, that it was no uncommon thing for the women employed in them to faint in the summer, should always have—as it has in the piece of evidence in which it occurs (No. 127)—reference solely to the past.

IV.—NATURE OF EMPLOYMENT.

Rag cutting, dusting, &c.

17. Females of all ages are employed in cutting and sorting rags, or cotton waste. They stand for this purpose at long narrow tables, each having a separate pit of rags and space of the table to herself, part of the latter being hollow and covered with open wire so as to allow the dust to fall through, as the sorter picks or cuts the rag above it. A short strong knife, in some cases part of an old scythe, is fixed upright in the table, the edge being turned from the cutter, who reaches over with one end of the rag in each hand and drags it against the sharp edge. They seem to cut their fingers very often at first, but not very seriously.

18. Rags are in many cases dusted by means of steam power, before or after they are cut; where "bagging" and old ropes are used, they are chopped by machinery. The "duster" in the former case is like a large squirrel cage fitted with spikes inside and raised at one end; the "chopper" is an open wheel, the outer felloe of which is armed with knives and revolves at the mouth of a small trough-like feeder. These are sometimes fed by boys or girls as young as 12 or 13. It is in this department that the worst dust arises: some wear a handkerchief over their mouth and nose, but many do not adopt even that precaution.

19. In some mills the youngest sweep up—a very dusty operation in a paper mill, and one in continual requisition. Children also sort refuse paper and shavings, the cuttings of stationers and bookbinders, to be made up again. Women are likewise occupied in picking and chopping African or other grass; for the latter purpose a kind of chaff-cutter is used.

Grinding, beating, &c.

20. After the rags are cut and sorted, they are boiled in huge iron vessels; these are filled in some cases by women. The number of the subsequent processes, and the order in which they succeed, depend upon the nature of the article to be produced, and in different mills different modes prevail; perhaps the most common course is for the rags to be washed and ground in the rag engines, then bleached, next steeped for 24 hours or so: after that they are dried, and remain in that state till they are required for use, when they are put into the beating engines to be reduced into pulp; thence they pass in that form through pipes at once to the machine or the vat room, where the pulp becomes paper. These "engines" may be generally described as large round open vessels, about two feet deep, fixed on the floor, and provided with apparatus of grinding wheels, strainers, &c., as the case may be, for reducing rag to fibre, or fibre to pulp, or for keeping the contents in motion.

21. The work of children and of women in these engine-houses consists chiefly in fetching and carrying stuff in baskets or "boxes," trucks on wheels in some cases, in filling the rags into the "engines," and, in the case of fine paper, in picking any foreign substance out of the half-stuff, as it is being ground down to pulp in the rag engines. The number employed in this department is never large.

Steam power.

22. The use of steam as the motive power of all the above-named engines is now nearly universal, and even where manual labour is still used for making, sizing, and drying the paper, it is usual to have the rag engines, presses, rollers, and glazing machines, all moved by steam. For the hydraulic press a hand wheel is sometimes used, but it has been found very fatiguing for a lad of 16 or 17. (No. 132.) Only two of all the mills visited by me depended solely, or even chiefly, on water power. (Nos. 96, 157.)

Paper making: 1. By hand,

23. Where paper is made by hand the paper-makers work in crews of three to a vat. Two of these three, the "vatman," who dips his mould or frame into the pulp which the vat holds, and the "coucher," who receives the mould from him and turns the sheet out from it on to a felt or blanket, are always adults; the third, the layer, is frequently an apprentice of 16 or 17 years old. His duty is to take the sheets one by one from the "post," or pile of felts and sheets, after they come from the press, and to place each one smoothly and evenly on a low desk called the lay stool; as he does so, he throws each successive felt on to a "felt board" or trestle within reach of the coucher. He also assists in putting the "post" under the press.

24. When the sheets are very thin the layer requires assistance, which comes in the shape of a "slice boy," often a child of 9 or 10 years old, who "draws the slice." This is a thin wide strip of

wood covered with felt, and fitted to a handle. The boy sits or kneels before the lay stool, and places the front edge of the slice at the bottom of the last laid sheet, so that the next sheet may be prevented from sticking to it until the top and sides have been laid square. The slice boys are sometimes allowed to throw "the felts," but they are seldom strong enough, as both throwing and laying are "back-aching work." (Nos. 74, 75.) These boys have three or four minutes rest in every 24 minutes, while the crew are pressing, but they sometimes help to "squeeze" in that time. (No. 76.)

. By machine.

25. When the paper is made by a machine, the pulp passes over a wire or strainer to felts which convey it, as it assumes consistency, to drying cylinders, and through a size-trough to other cylinders, at the end of which it is either reeled off in one continuous web and removed for cutting elsewhere, or cut at once into sheets of the requisite dimensions by a cutting machine attached to the making machine. This is the course with ordinary news and printing paper.

26. In Lancashire young boys called "picker-scrapers," stand on a stool by the side of the paper machine, and rake off the dirt which collects on the "picker" or strainer, over which the pulp flows; this is rather wet work. (No. 164.)

)rying and izing.

27. For machine-made writing paper of the better class the processes of drying and sizing are much more elaborate; a large billiard-table-like trough, with long endless felts passing through, is substituted for the narrow size-trough, and a series of hollow drums containing fan wheels fills a drying chamber, in some cases so large as to hold at any one time a length of half a mile of paper in motion over the drums. Boys of 10 or 11 are sometimes employed in watching the paper, as it passes over these drums, to give notice to the man of any defect in the paper; but those who watch the cylinders, which are in immediate connexion with the machine, are rarely under 14 years old; these have also to give the men general assistance, and often are apprentices.

28. Girls of 13 and upwards, at either end of the size trough, lay sheets three or four together upon the endless felts, or take them off when duly sized, and part them. Good writing paper is in some cases sized by hand by young women.

'utting ma- hines.

29. Among the youngest boys are those in the machine room, who receive the sheet as it falls from the cutting machine, or take it from the felt on which it falls, and make it lie smooth on the catching table, a sort of desk below. The drawing large sheets off the felt is said to be often very heavy work. (No. 115, and see 37.) When a small sheet is made, the desk is nearly upright, and the cutting table and the making machine are often separate; but when the sheet is large, the child stands at the end of the paper-making machine, to which an apparatus for cutting is fixed. He is in that case exposed not only to the greater heat generally found in the paper-making room, but also to the longer duration of work caused by having to cut each sheet separately, as the web of paper passes from the cylinders, instead of cutting 4 or 5 at once. He is, moreover, liable to be delayed by any breakdown or other cause, which retards or stops the working of the paper machine and involves labour beyond the usual hours to regain time so lost.

30. I did not meet with any instance in the south of England of a girl under 13 being employed in the machine room, nor are such cases common in Lancashire, though they do occur there; girls from 15 years of age are so employed at some mills in both districts. Where females work in the machine room, it is, I believe, invariably at the "cutter." Both girls and boys are also employed to carry off the sheets from time to time, as they accumulate upon the table.

31. There is usually in the south an extra boy, who relieves one of the others employed at the cutting machine; the number employed at each machine varies also with the size and number of the sheets that are being cut, so that each boy is often not actually at work, or at all events not at the same work continuously, for more than two hours out of every three, or three out of every four, during which he is in attendance, but it may happen that all are required at once, as for instance to help in case of a breakage of the paper.

lazing rolls.

32. Where writing paper is made, many children and young persons of both sexes are employed in the glazing room. Each sheet of paper is laid, by boys of 10 or 11, or girls rather older, alternately with a thin plate of copper, in a pile called a "wad," which is then carried by lads of 15 or 16 to heavy rollers, and passed under them. After this the wad is brought back to the same or other children, to be unpacked and refurnished. In one case the wads were placed on small carriages, and pushed by girls of 15 and upwards along a tramway on the table to the glazing rolls. The youngest girls in some glazing rooms merely push the sheets along a table between two light calenders, which stand at each end of it and are worked by young women.

'aper sorting, &c.

33. Girls of 14 and 15 are also employed to pick defects out of the paper with a small knife, and to "part" or separate the sheets from each other. Young women, and sometimes lads, sort the finished sheets of paper; if they do not wear rags or finger stalls, their fingers and hands are often cut by the sharp edges of the paper.

Mill boards.

34. When mill boards are made by machine, a boy stands at the end of the machine and with his finger rips the damp board off the reel at each revolution, the circumference of the reel determining the size of the sheet, and lays it on a trestle behind him. This is very tiring when the pile is high, as a long reach is then required. Mill boards are also laid out to dry in the fields or the drying loft, and are taken out from the glazing rolls, by boys of 11 or 12.

V. HOURS OF WORK.

35. The ordinary hours of work in paper mills are different in different districts, and also in different departments of the same mill. Those of the makers proper of hand-made paper—the vats' crew—are usually from 5 a.m. to 5 p.m., or less; under great pressure night and day shifts of 12 hours each have been sometimes adopted.

36. In Lancashire, the usual hours for day-workers are from 6 a.m. to 6 p.m. Cutters and sorters of rags, paper shavings, and the like, whether for hand or machine made paper, very rarely work more, and in the south usually less, than 12 hours a day; sometimes only 9 or 8 hours, and in almost all cases only by daylight. In the rolling, glazing, and paper-sorting departments also, though the ordinary 12 hours are frequently exceeded, the work is usually limited to the day time.

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Night work.

37. But for all the processes through which the material passes, from the first washing or grinding in the "engine," after being cut, to the machine at which it first becomes a sheet of paper, night work is, in the case of machine-made paper, though not universal, at least the common practice; and, so far as the preliminary washing, beating, or grinding are concerned, the same remark applies to hand-made paper.

12-hour turns.

38. This work is in such cases continued by relays without cessation through the week, usually from 12 on Sunday night to 12 on the following Saturday night. There are two modes of arranging these relays. That which prevails in Lancashire, and to some extent in Kent and other places, is to have each relay work for 12 consecutive hours, from 6 a.m. to 6 p.m., or from 6 p.m. to 6 a.m.; those who take the night turn of one week taking the day turn in the next. In order to effect the change, the set which commences work at 6 a.m. on the Saturday of the week, during which they have the day turn, works on till 12 on that night, comes again at 12 on the Sunday night, and goes on till 6 a.m. on the Monday morning. At that hour they are succeeded by those who have been on the night turn of the previous week. The result of this is that those on the day turn work five days of 12 hours and one of 18, those on the night turn five nights of 12 hours and one of 6 hours, in each week.

24-hour journeys.

39. The other system of relays is not uncommon in Hertfordshire, Buckinghamshire, and, so far as the "rag" and other "engines" are concerned, in Kent and elsewhere. Each set works 24 hours consecutively, from 6 or 7 a.m. on alternate days, one set working for the first 6 hours of the week up to 6 a.m. on the Monday, so as, with 18 hours on the following Saturday, to make up the third 24.

Day of 16 hours.

40. In some instances an intermediate system prevails: those who work at the "engines" have their 12 or 24 hours alternate shifts, while those at the paper making machines attend for a working day of 15 or 16 hours' duration every day in the week, a system which might seem to combine all the evils of both the 12 and the 24 hours' relay, without the advantages alleged in favour of either. Each one however, providentially prefers the plan under which he finds himself for the time; a boy of 13, who had been "used to work night and day turns of 12 hours," told me with apparent sincerity that he liked better working from 6 a.m. to 10 p.m. as a general thing, with an occasional variety of coming at 4 a.m. or staying till 1 a.m., at his present place of work. (No. 95.)

Objections to night work.

41. Each system has its advocates, and there are those also who do not hesitate to state their strong objection to night work in any form and for any age or sex, objections based on social, moral, or economical grounds. (Nos. 108, 115, 152.) "When young people of both sexes work through the night "together, it is a bad thing, and is well known to have bad results." (No. 115, see 157.) "I think "night work dangerous, and scarcely profitable," says one employer. (No. 152.) "I must say, for my "own part," says Mr. J. MacMurray, that I very much dislike and disapprove of this night work." And after referring to the social and moral results of the practice, he adds: "My own conviction is, though "I believe that very few employers in our trade agree with me, that if a general Act were passed to "prohibit night work altogether, for male adults as well as for women and children, it would be a benefit "to the trade."

42. The children and young people themselves who are on night and day turns always prefer the latter. (Nos. 109, 113.) "It is so much hotter in the night." (No. 20.) "I could never rest properly "in the day, for the week when I was on the night turn." (Nos. 95, 73.) And of course that is more so, when the night work is occasional. (Nos. 14, 17.)

43. So far as females are concerned, a regular system of night work exists only in those cases in which persons of that sex are employed at cutting machines which are attached to paper making machines, or where they help in the rag engine house. (Nos. 41, 108.) They in some instances work the 24 hours' journey (No. 115), but more often 12 hours in alternate weeks. (Nos. 40, 108, 157.)

44. The question of night work in connexion with the 24 hours' journey will be more conveniently considered elsewhere. (Sect. VII.)

Overtime:
1. In machine rooms.

45. It will now be necessary for me to call your attention to the occasions and the extent of work beyond the ordinary hours, to which my remarks have hitherto been directed. Where night and day turns of 12 hours prevail, it sometimes happens that, owing to the absence of his mate, a youth may go on for a double turn, or the whole 24 hours. This is, however, of rare occurrence. (Nos. 60, 83.) The boys in the machine room, however, have to wash and clean up; this takes place once or twice a week, or more, and occupies about two or three hours, during which both sets are engaged together. (No. 12.) Where the system of 15 or 16 hours' work every day has been adopted, this cleaning up goes on in a part of the time during which the boy is relieved from the cutter; so that, for example, a boy of 13 who was at the mill for 16 hours every day, but was off work for four hours out of that, had to clean up for an hour and a half every other day. (No. 31.)

46. The overtime in the machine room is by no means confined to the hour or two required for cleaning up from time to time. The boy whom I have already quoted (No. 31), had worked twice all night, and once till 10 p.m. Another, whose ordinary hours were the same as those of the last mentioned, 16 in the day, came "once last week at 4 a.m., and stayed till 10 p.m.; worked twice in the week before that "till 1 a.m., and came again at 5 a.m. the first morning after, and at 8 a.m. the second." (No. 95.) At this mill they work all night for about 10 nights in the year. (No. 94.) At a third, where the ordinary hours for the machine are from 6 a.m. to 6 p.m., the average hours of work for the whole year not exceeding 72 in the week, a boy under 13 had been in attendance during the first three months of the year for five weeks of 80 hours, one of 85, three of 90, two of 92, and one of 100. (No. 48.) At a fourth, where the ordinary hours are 15 a day, 5 a.m. to 8 p.m., a boy of 11 had "worked all hours; "often 24." (No. 52.) Another, aged 14, had "often worked 24 hours all together, and 36 hours right "off about six times, in the year during which he had worked there." (No. 51.) A third, also aged 14, who couldn't "say exactly" what were his regular hours of work, "comes sometimes at 6 a.m. and "sometimes at 4 a.m., and leaves sometimes at 8 p.m. and sometimes at 10 p.m., and sometimes goes on "all night:" he had several times worked "all night, and next day too, 36 hours." (No. 53.)

2. In vat rooms.

47. Those who make paper by hand rarely exceed 13 hours a day, from 5 a.m. to 6 p.m., and their usual hours are less than 12. One boy aged 11 had, once in about six months, worked from 3 a.m to 5 p.m. he came "ever so many mornings at 4 a.m. and often worked on till a little past 5 p.m., but never after 6 p.m. (No. 76.)

3. In glazing rooms, &c.

48. It is very common for the boys and girls employed at glazing rolls and calenders to work 14 hours a day, making two or three hours overtime, for a fortnight or more at a time. (Nos. 14, 17). A girl aged 12 worked from 6 a.m. to 8 p.m. for a month at a time; she had twice worked till 12 at night. (No. 42.)* "The smaller ones get very tired by 8 p.m." (No. 169.) Another aged 15 had worked once all night, and once till 12 p.m., in the last year. (No. 43.) At some mills, both machine and hand paper mills, the work in the glazing room lasts for 14 hours a day during the greater part of the year; in one case for nine months out of the 12. (Nos. 50, 69, 125.) At the same mill 13 females (none being children) work at three "hot rolls," four to each, three working at a time and one to relieve, besides a supernumerary; these work the night through two or three times in a week. (No. 50.)

49. The hours in the "sol," or paper sorting-room, are also not unfrequently at some mills prolonged until 8 p.m. from 6 a.m. (Nos. 44, 83, 159, 178). At a hand-paper mill a girl of 15 had worked many times from 6 a.m. to 9 p.m., part in the "sol," (where the picking, folding, and sorting the paper is carried on,) and part in the glazing room. (No. 64.) At another, a boy of 11 came to work at 5 a.m. on most days, and left at 7 p.m., or sometimes 8 p.m. (Nos. 130, 131.)

50. Similarly, a boy of 12½, employed chiefly to take mill-boards out from the rollers, often made 7 or 7¼ days of 12 hours (including meal times) in a week; in five days of a recent week he had made 15 hours overtime; on two of those days he had been employed for 16 hours. (No. 105.)

Work in glazing room and in machine room compared.

51. This work in the glazing room, though not heavy, nor, in point of actual time, so protracted as that of those in the machine room, is in fact equally, if not more fatiguing; for it is continuous and unvarying. I am quite at a loss to understand upon what principle it is considered requisite for a boy of 12, who sits on a stool and keeps sheets of paper straight as they drop from a cutting machine on to a table, to be off work for every third or fourth hour of the twelve, during which he attends at the mill; while under the very same roof a girl of 12, who sits on a stool and takes sheets of paper out from a mixed pile of copper plates and paper sheets, works, for a month together, 14 hours a day without any regular relief or cessation beyond two, or at most three, breaks of half an hour each for her meals. In the former case, moreover, there are often long stoppages, most frequently because the paper breaks, but also to change sorts and for other purposes. These stoppages are said to take up on the average at least one or two hours in the 24 (Nos. 12, 40, 48, 54, 77, 108, 135, 152); and though they may involve more active work on the part of the boy than if he were at his catching table, yet they also give a complete change and bring a fresh set of muscles into play. The child in the glazing room, in busy time at all events, knows no change; one sheet of paper is very much like another; and she has not even the relief of carrying the "wad" to the rollers, for that is too heavy for her, and is therefore left for stout lads of 15 or 16.

Detached cutting machines.

52. In respect of the hours of work, the boys who work at a cutter, which is detached from the machine at which the paper is made, are much better off than those who, as is more frequently the case, work at one which is in fact a part of the latter. In the detached cutter from two to seven reels of paper, according to the nature of the particular machine, can be cut into sheets at once; and four or five reels are often cut at one time. (No. 77, see 55, 134.) The consequence is, that overtime at a detached cutter is comparatively rare, is not excessive (No. 135, 184), and is generally avoidable altogether.

Rag cutters.

53. Rag cutters in some few cases have stayed an hour or two beyond their usual time, but even with that overtime their hours of work would not exceed 13 in the day. It is a rare thing for any rag rooms to have gas laid on. (Nos. 40, 62, 98.)

Effect of abandonment of night work.

54. Where the night work has been given up, as is now the case wholly in some mills, (Nos. 170, 182, 183,) those who work at the beating, grinding, and washing engines, and at the paper-making machines, must be added to the number of day-workers. It is to be regretted that the abandonment of night-work, has in some instances led to a great increase in the amount of overtime. This advantage at least there is in a system of night and day relays, that with the exception of occasional cleaning up, neither set works longer than the full 12 hours, inasmuch as each is obliged to make room for the other at the engines or machines, where both sets work. When, however, this restriction is removed, the effect appears to have been, not only to encourage longer hours on the part of those who had been thus prevented, but by the infection of example to lead to a general disregard throughout the works of even the employers' orders in that respect. "The cases which you tell me have occurred on "my works, of children staying till 12 at night, and all night, are in direct violation of my express "orders to the foreman, and they need never occur at all." (No. 159.) The cases were those of a girl of 12, who had worked in the very dustiest of all the occupations, at the rag chopper, once or twice till 12 at night (No. 162); and of a boy of the same age, a picker-scraper, who had worked at the paper machine three or four times all day and all night. (No. 163.) Working till 9 and 10 p.m. from 6 a.m. was, as might be expected, when the above instances were found, by no means uncommon. The same girl had stopped till 9 p.m. "catching" once or twice a week. Another "picker-scraper," not 10 years old, had worked till 10 p.m. "quite a dozen times" in four months, and said that he was always very tired then (No. 164); and other boys of 13 and 14 had stayed till 9 p.m. "many times."

VI.—MEAL TIMES, HOLIDAYS, TREATMENT, ACCIDENTS.

Meal hours.

55. In the machine-room and the rag-engine house, the work goes on continuously without any stoppage for meals. Mr. Wrigley (No. 159) has at some length explained the necessity that exists for such a system. At the same time it must be observed that the children and young persons have opportunities for leaving the room from time to time for short periods, and in most places are allowed to do so. This, however, often depends on the good nature of the man under whom they are working, and, in the case of the paper-making machine, on there being a spare hand on the spot, to relieve them by taking their place.

56. It is common for them to take their meals in the machine-room, but the practice of having one boy more than is wanted in the ordinary course of work, enables each boy or girl at the cutter to take

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* This girl had worked at 10 years old every night for a fortnight till 9 p.m. from 5 a.m. She was then working at a "ruling "machine," an occupation connected with the business of a wholesale stationer, and not usually found in a paper mill.—H. W. L.

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Mr. H.W.Lord.
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20 minutes or half an hour for meals twice in 12 (No. 20, 40), or three times in 16 hours (No. 31). Where the cutter is not attached to the paper-making machine, the former is usually stopped for meals. (Nos. 78, 80.)

57. In other departments half an hour or an hour is allowed for dinner; they have half an hour for breakfast, or for tea, if they work 12 or 14 hours; in some cases, even where the day's work is 11 hours or less, this second half hour is given; a third half hour is usually allowed when they work overtime, 15 hours in the day. They go home for dinner if they live near enough.

58. Sometimes only one meal of half an hour is taken during the 12 night hours. (No. 14.) In the 24 hours' journey supper is taken at 10 p.m., and "a drop of tea and a wash" at 4 a.m. (No. 82.)

59. Those who are on the night turns usually take their breakfasts as soon as they get home, and then go to bed for six or eight hours till dinner, and if they are on the 24 hours' journey, have another seven or eight hours' sleep before going to work next morning. (Nos. 73, 112, 154.)

Holidays.

60. A day or two at Christmas and at Easter or Whitsuntide are usually taken as holidays, but there are no regular holidays throughout the trade. Good-Friday is not a general holiday. "If it were "requisite they would work on Christmas-day as on any other day." (No. 94.)

61. The day workers leave earlier on Saturday, usually at 4 p.m. or before. The vats' crew in hand paper mills leave at 10 or 11 a.m. on that day.

Treatment.

62. "There is no ill treatment of apprentices or other boys now as there was once in the trade; they "don't get knocked about as they used to be." (No. 71.) So far as my own observation went this statement seemed perfectly correct. I have not, speaking generally, in any manufactories, seen a happier looking lot of children.

Accidents.

63. I have been unable to obtain any statistics relating to the number and nature of accidents in paper mills; they are said to be much less frequent than they were, but there is no doubt that injuries of a more or less serious kind, occur with sufficient frequency to justify Mr. Pomfret* in considering that "fencing" is as necessary there as in print-works. (No. 193.) In one mill two fatal accidents had happened in one year. It was stated, however, that they had not had one for 20 years before, and nothing was known of the causes, as no one was near in either case at the time. The resident surgeon at the West Kent Hospital, Maidstone, informed me that the accidents at paper mills which came before him were seldom more than cut fingers, the worst cases being those caused by the cutting machine, when the top joints were taken off. The "cutter" in many cases is a heavy knife which works horizontally; when the upright bench is used, this is a little way above and in front of the head of the catching boys, and within reach of their hands. At times a sheet will stick and not fall properly, and in trying to pull it down a finger top is taken off; but injuries arise here more commonly from a boy's putting his finger up in play, or being dared by another to do it. (No. 45.) Fingers are often nipped and "broken" in feeding the rollers (Nos. 50, 84), or in leading the sheets of paper through the cylinders. (Nos. 77, 115.) So in feeding the rag chopper fingers have been taken off. (No. 88.) Some of these are apparently not such as would have been prevented by fencing; but I have myself seen shafts and driving straps in such dangerous positions, and so inadequately protected, as to cause me to be very incredulous of assurances that no accidents have happened from such causes. A mere board fixed across the rollers will prevent the hand from being caught. (Nos. 50, 84.)

64. Sometimes serious accidents occur. At one mill a boy's thigh had been broken by the cog wheel on which he fell, in consequence of his foot slipping, as he bent forward to lead the paper through. A man's arm had been broken there in a similar way. (No. 106). In another a man's arm was caught as he was "tearing a crack away." (No. 116.) It is to be observed, however, that machinery in a paper mill is driven at a speed much less than that which is usual in the manufacture of textile fabrics. In few mills is the rate for the paper to pass over the cylinders greater than 80 feet per minute, or the speed of the beating engines more than 140 revolutions in the minute. (No. 54.)

65. Horizontal shafting along the floor, and unfenced cog wheels, are especially dangerous where women work. Crinoline is forbidden in several mills on this account. (Nos. 9, 77.) Cases have been mentioned to me of women being killed through being caught by the back of their dress, as they stooped or stepped back for a temporary purpose. (No. 77.) In another a man's arm was broken in saving a woman from a similar fate. (No. 120.) The use of loose blouses or aprons by the men is a source of great danger; these also are frequently forbidden. (Nos. 118, 152.) Several cases of deaths arising in this way have been mentioned to me. (No. 62.) Instances of injury from the careless shifting of straps are found to occur. In one a boy was supposed to have been killed in putting on a strap to set some machinery in motion at which he wished to commence working, without waiting for the man, whose business it was to put it on. (No. 34.)

66. It seems that the existing modes of modifying the speed of the paper-making machines render it necessary to leave some large driving wheels and pulleys unfenced. This modification is effected by the addition or removal of a piece of felt from the circumference of the wheel (No. 77); and in effecting it accidents have occurred. Parts of the machinery are commonly oiled and cleaned while in motion; precautions against accidents from this source in the nature of wooden galleries over shafting and heavy wheels are usually adopted, but they are often not sufficient to prevent serious injury. Long tubes are used for pouring the oil into parts where it would be dangerous to go close, and in one instance I noticed that lubricators were fixed on the axles of the wheels of the drying cylinders. (No. 77.) One case is mentioned of a man who was caught by his "slop" by a shaft overhead as he was oiling; "no bones "were broken, but it was a very near thing . . . as it was, the front of his body was completely "flayed." (No. 54.) A boy who was cleaning part of the cutter had his finger drawn in and broken through getting the wiper entangled in the cog wheel. (No. 8.)

67. Bad accidents have also occurred though the escape of steam and bursting of rag boilers. (Nos. 77, 116.) The rag cutters seem not to injure themselves much by the cuts which they frequently give their own fingers. (Nos. 19, 45, 46.) A strange case of tetanus occurred in the west of England last year, but I have not met with other instances.

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* This gentleman, a surgeon resident at Hollingworth, states that he had recently to amputate the leg of a child who was caught by a shaft in a paper mill while taking its father's dinner to him.

VII.—Influence of Employment upon Physical Condition.

68. With reference to the general health of the persons employed in the various branches of paper making, other than rag cutting and bleaching, I have, I regret to say, very little evidence to offer you. I have endeavoured, by communicating with the clergy and medical men in several districts, to obtain their experience in the matter, and have particularly sought to learn their opinion as to the effect of the 24 hours' journey on alternate days, or the daily work of 15 or 16 hours in the machine room. I have however, for the first time since I have had the honour to be engaged in these inquiries, found my letters generally disregarded and unanswered. In one instance I was told, by an employer, that the clergyman of his parish, to whom I had written, had said that he thought my inquiry a very impertinent one, and did not intend to take any notice of it. Without speculating upon the reasons for this conduct, or assuming that the others, who have not answered my letters, took that view of their object, I cannot but think that the peculiar "local conditions" which compelled one of my few correspondents to request that his name should not appear (No. 190), may exist in one form or another, and perhaps in greater force elsewhere.

Healthy appearance.

69. Under these circumstances there is danger of being misled by *à priori* reasoning. I am therefore bound at the outset to state that children and young persons in paper mills, so far as my experience goes, do as a rule look healthy, and say they are so. Their employers, many if not most of whom are men of superior intelligence and education, express similar opinions. At the same time they are naturally enough indisposed,—and probably from mere habitual familiarity unable,—to see in their own system evils, which may be patent to a stranger. I make these remarks because I find it quite impossible to think otherwise than ill of a system, under which a boy only 11 years of age attends at his place of work for 24 consecutive hours, even though he be off work for the following 24, and whether he have two, three, or four hours of so-called rest during that attendance. (Nos. 79, 82, 136, 137, 151.)

Opinions as to effect of 24 hours' journey.

70. I may observe that my opinion on this point is not without support among paper manufacturers who work upon a different plan. All, both those who have adopted the system of 12 hours' night and day shifts throughout the pulp-preparing and the paper-making portions of their works, and those who apply that system only to the former, and make their paper in daily shifts of 15 or 16 hours, concur in condemning the 24 hours' journey, and this, whether they have adopted one of the other plans from the first, or have deliberately abandoned their earlier practice. (Nos. 11, 26, 60).

71. Thus Mr. Saunders' foreman at Dartford, while he thinks the 24 hours' journey "does no harm at " all to adults," says it is "certainly too much for their physical condition at that age" (under 18). (No. 40.) The manager of another mill there finds " all of them much more fit for work, since the 12 hours' shift " has been substituted for the 24." (No. 45.) Mr. Simpson, of Maidstone, whose men work the 24 hours' shift, has the 12 hours' shift for boys, "not thinking it right that boys should work so long as 24 hours." (No. 54.) "As to boys," said Mr. Venables, of Taplow, "it stands to reason that it cannot be good for them." (No. 98.)

72. On the other hand, employers, in whose good faith I have implicit confidence, declare that they do not find the health of the boys injured by the 24 hours' work (Nos. 62, 77, 152), and the men (Nos. 79, 153, 154, 155), if not the boys themselves (No. 80, 151), prefer it, from mere force of habit (No. 115), and perhaps, as one said to me, "because they often do nothing for 7 or 8 hours out of it, and work " in their garden, and do as they please, on the alternate days." (No. 114.)

73. I have received a letter from a clergyman, held in high respect, as I am well aware, by the owners of the paper mills in his parish, whose "local conditions" are not so "peculiar" as to prevent his giving me the benefit of his experience, though his regard for them is strong enough to make him wish to suppress his name. "This," says he, speaking generally of juvenile work, "is bad for them physically, " but the chief injury is the night work in the mills, where many are kept on 24 hours at a time " (and the same off): the effect of this is grievous in some instances;" and in a second letter, "occa- " sionally we have seen a lad looking very badly, and on inquiring, his mother has said, 'Oh, it is " 'the night work,' or 'the journey, 24 hours' work.'" (No. 188.)

74. It is to be observed, that the long turn of 17 or 18 hours which occurs once in every fortnight at mills where the 12 hours' night and day shift prevails, is always spoken of as being very fatiguing. (Nos. 20, 104, 110, 113.) It may be said that irregular or intermittent overwork affords no fair test of the effect of a regular system of 24 hours' work, "on and off." This is an argument, however, which cuts both ways. The plan recently adopted at Mr. Joynson's, of leaving off at 6 p.m. on Saturday, and not beginning again till 6 a.m. on Monday, seems to have given great satisfaction in all quarters. (No. 11.)

Statements of children as to effect of overtime.

75. The account given by children themselves of the effect of working much longer than their ordinary time never goes beyond an admission that they get very tired and sleepy. So says a boy of 14, who usually works from 14 to 16 hours a day, about working all night. (No. 53.) " I shouldn't at all like to do it for 24 hours at a stretch," said a machine minder, aged 18; "I get " quite tired enough after 12." (No. 102.) Girls of 12 in the glazing rooms get very tired and sleepy by 9 p.m., when they begin at 7 a.m. (Nos. 14, 17.) A girl of 15, working for three nights together till 9 p.m. from 6 a.m., "was tired, but not so very much" (No. 64); another, aged 17, found 6 a.m. to 6 p.m. quite long enough for her. (No. 44.) One manager thinks 12 hours' constant work at the cutter too long for boys under 16, without an extra hand to relieve them occasionally. (No. 45.) An employer thinks seven hours a day among the rags quite long enough for women of any age. (No. 152.) And another says of his own rolling (glazing) room, that work from 6 a.m. to 8 p.m., a common thing there, is too long for the boys and young women who are in that department. (No. 69.) "I found " those hours," said a boy, who was about 13 at the time of which he spoke, "not exactly tiring, but " very wearying, for there is no change." (No. 74.) It is pleasant to be able to remark that in the interval between my first and second visit to the Messrs. Balston's mill at Maidstone a regulation was made that no girl under 18 should work more than 12 hours a day there, whether at the same or at different kinds of work. (No. 62.)

Heat of rooms.

76. The extreme heat of some of the rooms is no doubt injurious in some cases. I have already noticed the case of the girl in the sizing room, who had been off work for a week at a time with "a sick head-

ache," caused by the heat. (No. 128). The heat of the machine room is also complained of (No. 192), and in one case a man whose son, aged 15, had worked sometimes from 4 a.m. to 8 p.m. at the cutting machine, still thought that it was the heat more than the hours of work that hurt him. (No. 156.)

Rag cutting.

77. The evidence which I have received relating to the effect of the dust in cutting rags is very varied in character. Some are not, they say, at all hurt by it. (Nos. 34, 58, 77, 152.) Others cough it up (No. 118), and it is admitted to be bad for persons with delicate chests. (Nos. 118, 119, 152.) At the same time I have myself seen, in rooms properly ventilated and not overcrowded, girls and young women engaged in cutting rags, whose appearance was as healthy as it well could be. Young women have stated to me that they found rag sorting and straw chopping preferable to work in a cotton factory, or even to domestic work. (Nos. 119, 171–3.) Two who were employed at chopping machines, the most dusty of all operations in the works, stated that they didn't mind the dust, had never been absent through illness, and liked their work better than hay-making (Nos. 174–5); while at the same works a young woman of 20, who had been a rag sorter, said that she had been once ill for three days with the dust, which made her feel sick and cough. (No. 176.) At other works a girl of 12, who fed the willow, stated that she had been ill two or three times with the dust, "bad on her chest," and had once stayed away from work for a week. (No. 160.) So a witness (No. 169), who admits that "the rag chopper " makes a tremendous dust, none can stay more than a few months at it," says very shortly afterwards, "I don't think any part of the work is bad; none of ours stop away for illness; for the first " three or four days after beginning they are generally poorly in the morning; that, I think, is more " the coming to work before breakfast, when they are young and not used to it; that soon goes off." It seems, at all events, a common practice among them to "take opening medicine for the dust." (Nos. 56, 57, 59, 118.)

78. The manager of the Standish mills, while he considers that the work in paper mills is not necessarily unhealthy, allows that, if the work goes on in places which are not properly contrived for it, it may be so, and observes that "the rag sorters often have to work crowded together in dusty rooms, all stifled " up; sometimes you have 40 or 50 women together in one badly ventilated room." (No. 170.) My own experience is in accordance with those remarks. The ill effects of continually inhaling fine particles of dust and fibre are now universally acknowledged; and the remarks already made by me in this report will have shown you that the atmosphere of certain rooms in paper mills is in many cases literally charged with such particles.

Bleaching.

79. Bleaching powder, which is now generally used in the South, is innocent; but where the material is "gas-bleached," a practice which still prevails in Lancashire, and to some extent elsewhere, injurious results follow, unless proper precautions for the escape of the chlorine are taken. One witness calls it " killing work." (No. 153.) "I was at that for three years, and it nearly made an end of me; I used to " spit blood; if it catches you when you open a chest, it throws you right down in a kind of faint; you get " blown out like a barrel." (No. 154.) "I remember being made ill for a week almost, by getting into " the smell of some, when they were using it very strong. Sometimes the gas comes out of the cham- " bers, and you can smell it half a mile off; it nearly chokes you" (No. 169); and though this witness goes on to state that it does no harm that he knows of, others speak of its getting on the lungs and " making you spit blood. When the bleaching is done in a hurry, it is used strong, and then it " is very bad;" the lads and women being just as likely in most mills to be exposed to it as the men who work in it. (Nos. 170, 180.) Similar effects, though in a modified form, are produced by the use of the "souring" (vitriol) put into the open "engine" to bleach "low sorts" of rag; the chlorine gas is set free and "gets on the chest and makes you cough and retch; I had to go to the " doctor and take pills" (Nos. 117, 152); "it made me get puffed, and blew me up like a toad." (No. 118.) They are frequently absent for one or two days at a time in consequence.

VIII.—Moral Condition.

80. The moral evils of young persons of both sexes working through the night together, is alluded to by several as being well known to have bad results. (Nos. 115, 108, 157.) The early precocity, developed by means of the children leaving school and getting employment in the mills, is also regretted in a letter to which I have already had occasion to refer. (No. 190.)

Education.

81. I found a rather higher average state of education among children and young persons in paper mills than in some other employments already noticed by me. Most attend Sunday schools, but only Sunday schools. The fact of paper mills being for the most part in country districts, where the work people, being inhabitants of some one or two villages at most, are not lost sight of, as in the population of a large town must be the case to a great extent, may account for the instances of gross ignorance being comparatively rare; at the same time I found in mills, where the children were above the average of education, several of 12 and 13 years old, who did not know whether England was governed by a king or a queen; had never heard of Queen Victoria, and did not recognize, when I mentioned them, the names of the chief towns in the county where they lived.

82. The reading powers of most were very limited; I should say that not 25 per cent. of all, whom I tested, could read one verse of an ordinary hymn without a mistake. At a mill in Kent four boys, aged respectively 11, 12, 16, and 18, examined by me in succession, could none of them read. At another mill in Buckinghamshire, out of six boys, of ages varying from 11 to 14, five knew only their letters; the sixth, who was selected as the best reader, spelt aloud every word of more than one syllable before pronouncing it, and made several mistakes.

Tests of knowledge.

83. Very few seem to have remained any length of time at a day school. I found it difficult to apply any fair test of the extent of their "schooling" beyond their reading powers, for scarcely any appeared to know, or to have learned, anything about English geography, or any but Bible history, derived from the Sunday school; and the answers given me upon the last-mentioned subject were not usually very encouraging. Many could not tell me the name of one of the Apostles or the Evangelists, though I helped them in every conceivable way by putting simple questions in a conversational manner, and almost leading up to the answers. I often asked the name of the Apostle who betrayed Christ, or the names of the two brothers who were called to follow Jesus, as they mended their nets by the seaside, or who Pharaoh, Joseph, David, Daniel, or Elisha were. To these and similar

Sunday school.

questions I frequently received very incorrect answers, and very rarely were two or three answered correctly by the same child; in some cases the answers were very absurd. I do not, however, attach undue importance to such answers, as proving an ignorance characteristic of any particular trade or occupation. Any one who has ever taken a class at a Sunday school, knows how often absurd answers are given upon matters, as to which children are supposed to have had full instruction. But the fact that such answers are so commonly given by those who do attend school on Sundays, and the miserable shortcomings in the way of reading which such Sunday scholars exhibit, point to the necessity of a much more extensive and regular system of enforced attendance at school on week days, if children are ever to understand and think about what they are taught in Sunday schools, and are to be left to improve themselves by self-culture or night schools, after they are 13 years old.

Poverty not the cause of ignorance.

84. In most instances in which I made the inquiry I found that the parents of ignorant children were in receipt of fair wages. In one case the father of a boy of 10, who had not been to school since he was eight years and six months old, was receiving 39*s.* 6*d.* a week in the mill, where this child also was getting about 5*s.* a week. He could read a little, but could not answer any question from the multiplication table, nor tell me the names or the number of the Apostles or of the Gospels. In another case a boy, aged 13, who could only read the word "Jesus" letter by letter, and was utterly ignorant of Bible history, was employed in the same mill with his father, mother, and two brothers: the joint weekly earnings of the family were 75*s.*

Encouragement by employers.

85. At some few mills attempts are made by the employers, or with their sanction, to give some rudimentary education to the children who work there. I have found in such places the state of education decidedly above the average. At Mr. Hall's, of South Darent, the men themselves teach the boys. Mr. Joynson has erected Sunday and day-schools at St. Mary Cray, at the latter of which about 160 children under 10 years of age attend. At Nash mill (Messrs. Dickinsons) there is a day-school at which nearly all the children attend on one day, at least, in the week. Attendance at night schools is also encouraged by several other employers. Perhaps the most signal instance is that afforded by Mr. Morley's mill at Wooburn (Bucks), where one of the clerks is accustomed to take half of the lads employed there on alternate days through the week for half an hour of their dinner hour. Here, 9 or 10 out of 24 read to me with comparative ease one of Longfellow's poems, and several of them did so with a propriety of emphasis and intonation, that I have not met with elsewhere.

General Remarks.

Limitation of hours of work.

86. Any proposal to limit the hours of work, or to abolish night-work for females and persons under 18, is looked on with very general disfavour by paper manufacturers, in the south at all events. (Nos. 101, 103.) "In order to get any profit out of the trade, we must work the machine more than 12 hours a "day, and must employ boys to catch the sheets." (No. 24, see 69.) Still some are ready to admit that "a law for boys to make not more than six days (of 12 hours) in the week would not inconvenience "them in their business." (No. 105.) "The prohibition of night-work for children and young persons "in our manufacture, would merely entail extra expense in an increase of wages by employing adults "in their place." (No. 77.) Mr. J. MacMurray, of Wandsworth, points out that any prohibition of night-work, which did not extend to the men, would place those manufacturers at a great disadvantage, who have the cutting machine attached to their paper making machine, and who are therefore unable to reel off the paper made in the night and cut it, several reels at a time, during the day, as is the practice where the two machines are separate, but would have to employ men at their cutters through the night. (No. 108.) It is to be observed, moreover, that, as has been already stated by me, loss of time from breakage of paper and other causes is of frequent occurrence and of very varying extent. (*See supra*, § 51.)

Half-time system.

87. Several employers think that some preliminary education might be insisted on as a condition of the employment of any child in a paper mill. (Nos. 69, 134, 135.) There seems to be no reason in the nature of the work in which the younger children are employed, against the adoption of the half-time system. (Nos. 134, 157.) Mr. Balston, of Maidstone, thinks that it would work well for slice boys in the hand paper mills. (No. 62.) The chief practical objection is the distance of the schools in country places. (No. 157.)

88. Where the population is scanty and the school at some distance from the works, there might be some inconvenience at first in procuring the requisite number to attend; on the other hand it is said that the number of children under 13 employed on the premises is in most mills so small that, where older ones could be obtained without a great increase in the cost, employers would probably prefer that course to undergoing the supposed annoyance of the system of school certificates, &c. The history of factory legislation, however, shows sufficiently how by degrees these unfounded prejudices die away, and the letters which I have received from mill owners in several towns of Lancashire do but give point to a truth already long recognized—the successful working of the half-time system.

89. From a letter received by me from Mr. J. Cropper, of Kendal (No. 194), it appears that he has voluntarily introduced a modification of the half-time system into his own paper mills, where the children—only about 12 in number—have been for some time employed in relays each alternate week, the set at work one week going to school during the next. This gentleman, moreover, states generally that he "would be glad to be under the Factory Acts, because it would make it easy to carry out rules "which now, by the carelessness of the parents and the mill foreman, are often broken;" and Mr. Wrigley, after saying that he could "contrive to let the young ones go at 6 p.m., if we were under "restrictions;" adds, "there is no reason why factories should be under restrictions, and not "paper mills." (No. 159.)

I have the honour, &c.

Henry W. Lord.

KENT.

MESSRS. W. JOYNSON AND SON, ST. MARY CRAY.

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631 persons are employed here: 35 girls and 60 boys are under 13; 84 girls and 58 boys between 13 and 18; there are 256 females over 18.

1. The subjoined list of the hours of work, &c. was furnished to me by Mr. Hepburn, who had prepared it for me by Mr. Joynson's direction. Mr. Joynson himself conducted me over the whole of his works, which are admirable for spaciousness, cleanliness, and excellence of arrangement, and gave me the fullest explanation of the many elaborate mechanical and other contrivances adopted there by him. Mr. Hepburn afterwards attended me while I examined a number of the children separately away from their work and from the foremen, and at my request verified or qualified their statements as to their age, hours of work, &c.

Occupation and Sex.	Hours of Work.	Age.			Meal Times and Overtime.
		Under 13.	13–18.	Over 18.	
MALES.					
Paper-making - -	6 a.m.—6 p.m. 6 p.m.—6 a.m. by weeks alternately.	9	18	77	1½ hours for dinner and breakfast; 2 or 3 hours overtime occasionally by those *over* 13.
Finishing - -	6 a.m.—6 p.m.	—	5	28	1½ hours for breakfast and dinner; 2 or 3 hours occasionally made, with ½ hour for tea.
Engineers, carpenters, &c.	6.30 a.m. to 6 p.m.	—	1	15	1½ hours for breakfast and dinner; overtime sometimes.
Glazing - -	7 a.m.—6 p.m.	48	34	12	½ hour for dinner; no overtime.
Rag store - -	7.30 a.m.—6 p.m.	3	—	5	1 or ½ hour for dinner; no overtime.
Overlooker - -	8 p.m.—4 a.m.	—	—	1	1 hour for supper; no overtime.
Total of Males -	- -	60	58	138	
FEMALES.					
Glazing - -	7 a.m.—6 p.m.	29	51	72	½ hour for dinner; overtime seldom, but occasionally. About 20 (half under 13) work till 9 p.m., having ½ hour for tea. In winter most work only till dusk.
Rag-cutting - -	7.30 a.m.—6 p.m.	6	33	184	½ hour for dinner; no overtime. In winter work only till dusk.
Total of Females -	- -	35	84	256	

The following statement, embodying the information given me by the above-named gentlemen, has been submitted by me to Mr. Joynson, and corrected by him.

2. At the time of my visit (Sept.) the full complement of hands were not present; about 100 more females were wanted in the rag room, and 50 more children in the glazing room, but could not be got; at that time of the year it is always difficult to get hands, as they prefer the change of fruit and hop picking; they would return towards winter, but in the spring even more would be absent. The overtime that did occur would never be necessary but for want of hands.

3. All may, if they like, leave the workroom at meal times, except those employed at the rag engines (beaters and washers), and at the machines. The youngest, however, of those employed at the former was only a month short of 18; the smaller ones in the machine room generally leave their work for meals, but as they may be wanted at any moment, they are obliged to take them in the room, though, as a matter of fact, they are very seldom interrupted. The women in the rag room, though they may go out of that room, are not allowed to quit the premises without a ticket.

4. The youngest girls in the glazing room receive from the first 9*d.* a day; boys earn 5*s.* and 6*s.* a week; at 14 years old one was earning 10*s.*

5. Only writing paper is made at this mill. Water is used as well as steam as the motive power, but is not relied on; and the water wheel is often driven by steam. A lift is used to raise materials from one floor to another. The floors are made of solid cast iron, and tramways are placed wherever trucks have to pass frequently. The roofs are arched, and consist of corrugated iron with a number of fan skylights in the centre of the arch; from the centre of each of them rises an iron chimney ventilator, with a double head bent over and opening downwards; this form has been adopted in order to keep the blacks from descending through the opening, and is found to be successful. In one large room, where large rag boilers are filled by women by means of cranes from an upper floor, this mode of ventilation is not applied, and the only relief to the great heat of the room is that obtained through wire windows at one end.

6. For the different purposes of the work 16 steam engines are used; three solely for driving a fan so as to cause a current of air through the drums, over which the paper passes to be dried after being sized, it being an advantage to dry the paper as cold as possible. The two machine rooms, which are of very great height and length, are ventilated by central louvres along the whole roof from end to end. In one of these rooms the length of paper passing at any given time between the making and the cutting machine is more than half a mile.

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7. All rags are dusted in a machine before they are given to the women to be cut and sorted. This practice is said to give great relief to the rag-cutter, who thereby receives the rags open and free from dust. These machines are all completely covered in by a wooden case so as to prevent the dust from flying about. The necessity for this appeared sufficiently from a view of the deposit of dust and flue, more than half an inch thick, which was lying over all the bottom of the case and bed, accumulated in four hours, notwithstanding that the rags used are of a much finer and cleaner kind than is cut for news or printing paper.

8. Gas is not used to bleach. The bleaching powder is applied in large vessels called tumblers to the rags after boiling, and not, as is usual, to the half stuff.

9. All cog-wheels and pulleys near which any persons were likely to pass appeared to be securely fenced. No crinoline is allowed on the premises. No talking is allowed either in the "sol" (glazing and sorting room) or in the rag room; "nothing is to be done without silence."

10. The work of the younger girls in the glazing room is to help the sheets along a small table from one calender to another; the boys take the sheets one by one from—or lay them between—thin plates of copper; alternate layers of a sheet and a plate form the wad, which is placed under the rollers of the glazing machine. Stout lads of 16 and more are employed at the glazing machines to lift the wads, &c. Young women put the sheets into the calenders and others take them out.

11. Mr. Joynson decidedly preferred the system of 12 hours to that of 24 hours; he had adopted it in 1840, when he resolved not to employ union men in consequence of their resisting the change. He had then picked up any one he could to learn the business, and now all of those he employs are "his own breeding." He had very recently introduced, by way of encouragement to the men, the plan of leaving off at 6 p.m. on Saturday and not beginning until 6 a.m. on Monday, instead of the usual practice of working till midnight on Saturday and commencing immediately after midnight on Sunday. He was hitherto satisfied with the result, and so were the men, for they have the same wages as when they worked the 12 hours more.

12. The overtime made in the machine room by men and boys over 13 was for the purpose of washing up; it amounted to about two hours, and occurred once or twice a week for each set, either at 6 a.m. or at 6 p.m., so that both sets would work at once. The stoppages of the machine for one purpose or another occupy at least one and more frequently two hours out of every 24. Three years ago some of the girls in the glazing room had been on day and night turns for some little time of pressure, but Mr. Joynson disapproved of night work for children. At that time also the glazing boys ordinarily worked from 7 a.m. till 7½ p.m., with half an hour for tea, and the girls usually till 9 p.m.; now they all leave at 6 p.m., and have no time allowed for tea. Although an hour's work was thus abandoned, it was thought that very nearly, if not quite, as much work was done by them in the day as was before.

13. Although some had begun work a year or two ago at eight years of age, none were now taken so young; of those now employed by him one girl and nine boys were between 9 and 10, four girls and 16 boys between 10 and 11. Mr. Joynson had erected both Sunday and day schools in the village where most of his people resided; 300 children attended the Sunday schools, and about 160 the day schools; the age of the latter ranging from infancy to the time at which they could work, usually about 10.

14. *Mary Ann Wapshot* (glazing room).—Am 12; have been at work here a year; am in the glazing room. I help about; when they spoil a sheet I take it away. Work from 7 a.m. to 6 p.m., with half an hour for dinner; am not always at work; often rest and do nothing for some minutes. Have worked right off till 9 p.m., never later; did that for two weeks, up to the week before last, I think it was; had done so before, but never every night for a month. Some months ago worked all night for two nights; that is, came on at 6 p.m. and went away at 6 a.m.; had half an hour at 1 a.m. for a meal; have not worked at night before or since that time;* was doing then the same work as now. Didn't like that, got so very sleepy; so I did if I worked till 9 p.m.; mine is very easy work. I am quite ready to go home by 6 p.m. of a day.

Don't know what county this place is in, nor what county Maidstone is in, nor the capital of France, or of Scotland. Never learnt anything at school about the different countries of the earth. Read Bible at Sunday school. Elisha was a great prophet, and cured Namaan.

[Reads easy words tolerably.]

15. *Mary Abbott* (glazing room).—Shall be 11 next May, so am 10 years and 3 months now; have been a year here; take out the sheets from the copper plates. Always have half an hour for my dinner; take it here.

[Reads a very little.]

16. *Ellen Blackstone* (glazing room).—Am a little over 10½; came to work here a few months ago; Testament is about Jesus; don't know the names of anybody else in it; can't say who His disciples were; think I recollect about two brothers being called from fishing or mending their nets to follow Him; their names were Cain and Abel.

[A nice little girl, very nervous; had to spell all but the easiest words in reading to me.]

17. *Esther Kibble* (glazing room).—Am 12 years and 10 months old; have been here three years; have worked several times from 7 a.m. to 9 p.m., did so for a fortnight last time, that was last week or the week before; always have half an hour for tea when we go on till 9 p.m., as well as the half hour for dinner; generally at about 5 p.m.; am always very tired when 9 o'clock comes; work from 7 a.m. to 6 p.m. does not tire me. I lay the sheets, it is very light work. Once was on night time for a week;* did not like that at all. Can't write my name; know nothing about foreign countries, nor counties and towns in England. (Reads easy words.)

[Another girl from the glazing room, aged 11, read tolerably well, and answered some questions on Bible history correctly.]

18. *Betsy Cortes* (rag-cutter).—Am 12 years and six months old; have worked here a year. Our hours are from half-past 7 a.m. to a quarter to 6 p.m., with half an hour for dinner; eat that here; never worked longer than what I told you.

[Reads well, and knows where Dover is and France.]

19. Two other rag-cutting girls gave me similar information; one was aged 10 years and

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* Mr. Hepburn, "the only time for two years; now given up altogether."

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three months, and had been only a few days at work; the other was 11 years and six months. They said they cut their fingers now and then, but never so badly as to have to leave their work for the day and go home. Each could read easy words.

20. *Charles Phillips* (machine room).—Am 10 years and 10 months old; have been here six months; left for a year before that, and stopped at home doing school nothing. I and my cousin work together in this room; he is rather younger than me. We are on for 12 hours: six hours down at the cutter, and six upstairs looking after wet marks; that is up on the middle stage of the drying cylinders; it is all hot, but that is precious hot. What I do there is to keep a look-out, and when I see a wet mark in the paper going round, I holla; then the man comes and makes a notch, so that that piece may be torn away. I like day turn much better than night turn; it is so much hotter in the night. We have no regular time for our meal, but generally have it when the work is about half over; we take it just then in the room. I don't know how long I take; I have quite time enough to eat it. I don't ever eat much there, for I have no appetite, but when I get home I always eat very hearty.

Until a week or two ago we used to have to work 18 hours on the Saturday of the week when we were on day turn (from 6 a.m. to 12 p.m.), and came again from 12 on Sunday night to 6 a.m. on Monday. I used to get very tired at the end of those 18 hours, but that is given up now.

I could do sums and geography once, but have forgotten a good deal of my schooling now.

[This boy read well, and gave me very intelligent answers; he seemed strong and healthy.]

21. *Charles Thompson* (glazing room).—Am 11 years and six months old; have been here three years; began by putting sheets in; now put copper plates in; that is harder work, for they are heavier, but neither is hard. Work now from 7 a.m. to 6 p.m.; last year used to go on till half-past 7 p.m. always; had half an hour for tea then as well as the dinner half hour.

[Reads well, and answered several Bible questions correctly.]

22. *Samuel Turner* (glazing room).—Am 10 years and four months old; have been here a year; I take off the sheet from the plate. Daniel was in the lions' den; don't know any more about him; don't know anything that Elijah or Elisha did; don't know what counties are next to Kent, nor any towns in Kent. A large town on the sea coast is Waltham Abbey; wasn't born there; have never been there. Schoolmaster came from there: that's how I know it.

[Reads a little.]

23. *Charles Austin* (glazing room).—Am nine years and two months old; have been here a year and two months; take off from copper plate. Went to National school before I came to work; go to Sunday school now. There are three Gospels; their names are Father, Son, and Holy Ghost. Amen.

[When I helped him with the name Matthew he gave me Luke and John; but of the original answer I could get no explanation from him. I suppose that as I did not correct him as to the number in the first instance, his learning, which connected that number with the Trinity, misled him. He could not read, but knew most of his letters. He did not seem naturally dull.—H.W.L.]

24. I examined several other boys, whose ages were from 10 to 13 years; all knew their letters, but only one could read words of two syllables without a mistake, that one also told me where France and Italy were, but few of the rest knew even what county of England St. Mary Cray was in.

25. All whom I examined, both boys and girls, with one exception, said that they attended Sunday school, but from many of them I could get very little information beyond the book and chapter they had read on the last time of their attendance. Some, however, were very nervous.

MR. H. HALL, SOUTH DARENTH.

217 persons are employed here; 130 are females; 5 boys and 14 girls are under 13; 11 boys and 33 girls between 13 and 18; none under 11 years old.

The following account was derived chiefly from Mr. Hall himself, and read over by me to him on my second visit.

26. Those employed at the rag engines work in 12-hour turns night and day. Only four lads are thus employed; their respective ages are 15, 16, 17, and 18. The change at the end of each week is effected by those on the day turn working from 8 a.m. to 12 p.m. on the Saturday, and from 12 p.m. to 8 a.m on the following Monday. Mr. Hall was quite convinced that the 24-hours turn is a bad thing for the men, and stated that the older ones among them now preferred the 12-hours day and night turn. The hours in the machine room are 15 a day, 5 a.m. to 9 p.m. The system pursued with the boys at the cutting machine is to have all in attendance at the mill, but at work either every alternate hour, or for two out of every three hours in the 16 of which their day consists. In the hours at which they are not working they take their meals and play, and are taught by some of the men reading and writing. Some of the copy-books shown me contained very creditable specimens of writing.

27. The usual holidays are Christmas day and the next day, and Whit Monday and Tuesday; Good Friday is not observed as a holiday.

28. Only four females were employed in connexion with machinery; these were feeding the rag dusting machine; three adults and a girl of 17. The cog wheels which set the rag engines in motion are all thoroughly boxed in. Partitions descend half way down from the roof of the machine room on each side of the drying cylinders, so as to form a kind of shaft over them; at the top of this a fan constantly at work gets rid of much of the heated air through a hopper.

29. Mr. Hall told me that the number of children in his employ was at the present time larger than it had been before; this was owing to the opening of a new mill at Dartford, which had taken off some of his older hands. He hoped that these would remain in the neighbourhood as they grew up, and so render it unnecessary for him to take so many young ones to teach their work. They nearly all lived in the village in which the mill was, or in the next one.

30. The rag cutters usually have their own knives, purchasing them of their employers for 1*s.* 6*d.*, and paying by deductions of 3*d.* weekly from their wages. The length of time for which they last

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varies very much, depending on the number of rags cut and on the way of sharpening them. Steam pipes are laid round the rag room, so that the chill is taken off the rags in winter, and fingers are not so often cut. A steam cupboard and hot distilled water are available in the yard for food to be warmed and for tea. Separate privies are provided for either sex. The average earnings of females are 7*s.* 6*d.* or 8*s.* a week; from the wage account of the last week it appeared that one girl of 18 earned 11*s.* 3*d.*, a second aged 15, 6*s.* 4*d.*, while a third aged 19, who had not been absent at all, 4*s.* 10*d.* So one aged 13 years and 6 months earned 7*s.* 6*d.*, another, 11 years and 4 months, 6*s.*, and a third, 11 years and 8 months old, 4*s.* 1½*d.*

31. *W. Jones*, one of the boys aged 13, told me that in the two years during which he had worked at Mr. Hall's he had worked twice all night, and once till 10 p.m. Those were the only occasions he could recollect of being longer than the usual time, from 5 a.m. to 9 p.m. Work ceased on Saturday at 4 p.m. He had 20 minutes for each of three meals in the 16 hours, and was off work for three hours besides; for an hour and a half of that every other day he would be employed in cleaning up. He often played during the rest of the time, and had not written in his copy-book for a fortnight. (Read and wrote very fairly.)

32. *John Smith* (machine man).—I have always been used to the 16 hour shift; it never harmed me; eight hours off in the 24 has always been enough. That son of mine is 16; he began to work in a paper mill at nine years old; that was in Devonshire. He has always been in the machine room and worked the 16 hours there just as I did, for there was no system like that here for the boys having an hour on and an hour off. I never knew of that anywhere else.

[The lad referred to was a singularly well-grown handsome young fellow, standing 5 ft. 9¼ in his shoes, and weighing 10 st. 5 in a light mill dress.]

33. *Mary Ann Danes*, a girl aged 11 years and 8 months, who could not read, though she went to Sunday school, stated that she had been at work at Mr. Hall's as a rag cutter for about six months, and that her earnings in the last week were 4*s.* 2*d.* She had no father; her mother and two sisters, one just 10, also worked there, and two younger ones were still at home. Mr. Hall, jun., informed me that the family would earn frequently 24*s.* or 25*s.* a week; in the last week they earned 27*s.*

34. Two sisters, named *Mitchell*, aged 16½ and 14 years, very healthy looking girls, who had been cutting rags for a month, said that after the first day they quite got over all uncomfortable feeling of dust in their throat. They had been in service before they came to the mill, and much preferred rag cutting;—"Yes, sir, that's it, because we get our evenings to ourselves and all our Sundays out."

35. *Mrs. Oakley* (rag cutter).—Some want new knives before they have paid for the old ones, in less than six weeks; it depends on how they use the rubber for sharpening, and on how much work they do. I used to make mine last three or four of theirs, and some I have had have lasted me for a year. I and my two daughters earned 27*s.* 3*d.* last week between us; the youngest of them is 13, she has been here two years; she earned 9*s.* 9*d.* last week. The other is nearly 17.

36. *Mrs. Jones* (rag cutter).—I and my two boys work here; they are in the machine house. We earned 30*s.* 11*d.* last week. I made 10*s.* 6*d.* of that. I am a widow and had to keep them both five years ago. I used then to have 1*s.* a week from the parish, but the eldest then came to work and had 5*s.* 6*d.* a week, and I have had nothing from the parish since. He earned 13*s.* last week, and the other 7*s.* 5*d.*

37. *One of the men* told me that the work of the boys at the cutting machine was much lighter now that they had upright benches to catch the paper, and only to keep them even, than when they used to have to take the sheets from the felt and lay them on the table.

38. *Emma Johnson.*—Am 11 years and 8 months old. Have been here seven months. Don't know in what county Maidstone is. Don't know who governs England; not whether it is a King or Queen. (Reads fairly.)

[39. Nearly all the boys and girls could read; some well. Several could not tell me the name of the Queen. Most knew something of elementary Bible history. Very few could answer easy questions in geography.—H.W.L.]

Mr. T. H. Saunders, Dartford.

391 persons are employed in two mills; 3 boys and 4 girls under 13; 17 boys and 46 girls above 13 and under 18; 91 men and 230 women.

40. *Mr. Melbourne* (foreman).—We make writing paper and the best kinds of printing paper also. Most of the former is sized, and for that purpose is reeled off in the first instance and taken to another part of the building, where it is passed through a vat of size, and thence over a series of drums in a drying chamber to the cutting machine at the further end of the room. The intermediate reeling-off is a necessity imposed on us by the peculiar nature of our premises.

Our young lads all work at the cutting machine; they lay the sheets as they come from the knife. Two boys sitting side by side can lay three sheets; so that each of the three boys attached to our machines has to work only for two hours in every three. When we are on thin sheets, and the machines work faster, we have an extra boy.

These lads work in alternate shifts of 12 hours; none here under 18 ever work a 24-hour journey; That is certainly too much for their physical condition at that age; but I think that it does no harm at all to adults.

At one machine we have three boys to lay, and two girls, who stand behind them, to carry off the sheets from time to time. In this case there is no sizing. The girls leave off at 12 at night instead of 6 p.m. as the boys do, but both work day and night shifts of 12 hours. Two half hours are allowed for meals out of the 12.

The time consumed by necessary stoppages varies so much in different mills, and in the same mill on different classes of work, that it is impossible to give any average. With some papers felts are washed every week, with others every other day. We often don't change sorts for 48 hours. The deckles* can be shifted half an inch or so without stopping at all.

The hours usual for our rag-cutters are from half-past 8 to 6 or 7; but I have allowed some 10 or 12 women to stay later and cut ships' canvas by gas-light. They are chiefly widows who are glad to earn as much as they possibly can.

The females in the glazing room have nothing to do with the machine; they do not even carry the wads, for it is much too heavy work for them; stout lads do that.

The hours there and in the paper-sorting room are

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* Moveable sides placed on the wire, over which the stream of pulp passes, to regulate the width of the paper.—H.W.L.

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generally from 6 a.m. to 6 or 7 p.m., and on Saturday they leave at 4 p.m. Just now we are rather slack. They not unfrequently take half a day or a whole day for a holiday. I should say there is no difference in their hours of work, taking the year round one will have worked as much overtime as another. The information given you by (the next three witnesses) is probably correct.

All, both girls and boys, are hired and paid by the principal and not by the workpeople. Some of the girls have 2*d.* an hour; some 1½*d.* They begin as learners with 1*d.*

Some of the boys on the day turn go to a ragged school three times a week for an hour. The school is supported chiefly by Mr. Saunders. Several here have been taught there to read and write, and whatever else they know.

[One boy, aged 15, could not read.]

41. *Mr. Saunders,* on my reading the above to him, added that if any picking was needed at the rag engines, women were employed at his mills to do it, but, if the rags were properly sorted and cleaned in he first instance, that was unnecessary. He preferred adult women able to earn 12*s.* and 15*s.* a week as rag cutters, to children who could not earn more than 3*s.* or 4*s.*, spoiling the work and cutting themselves.

42. *Anne* (?) *Millist.* — Am 12; have been two years here. Am working now from 8.30 a.m. to 5 p.m. Our usual hours are from 6 a.m. to 7 p.m. I have sometimes begun at 5 a.m. For the first fortnight that I was here I worked every night from 5 a.m. to 9 p.m. I have never since that worked so long for so many nights; that was in the ruling room. I have often worked from 6 a.m. to 8 p.m. in this room; have done so for a month at a time. Have twice worked till 12 at night, never later. I can read. Don't know much about the others; know two cannot.

43. *Emma* (?) *Herbert.* Am 15 come next Christmas. Have worked here a year. Have worked once all night, and once till 12; but mostly from 6 a.m. to 7 p.m.

[44. Another girl of 17 in the paper-sorting room, whose name I omitted to ask, told me that she had worked from 6 a.m. to 8 p.m. for a week and more at a time several times a year in the three years during which she had been there; what she liked was work from 6 a.m. to 6 p.m., "that is quite long "enough for me."]

DARTFORD CREEK PAPER WORKS.

137 persons are employed here; 67 are females; 2 boys are 12 years old; 8 boys and 2 girls between 13 and 18.

These works are newly built and well arranged in respect of space, loftiness, and ventilation; the rag-cutting room in particular is very light, and fitted with ventilating louvres along the whole length of the roof.

45. *Mr. W. Reading* (manager).—We manufacture news and printing paper, not writing paper. Our 10 lads under 18 with two others over that age are employed at the cutting machine, which is attached to the paper-making machine. They work in two sets, taking night and day turns in alternate weeks; each turn consists of 12 hours, but we have six boys on in a set, though at present only four work at a time, so that they each work in effect two hours in every three. Sometimes, when the sheets are larger, when they are cut into three instead of into four, fewer boys will be required, but we always keep the same number on, and the spare ones can help when they are wanted. I think it necessary to have this system of relief for those boys; for 12 hours constant work would be too long at the age that most of them are, from 12 to 16, even though the work itself is light.

We do not need any one to scrape our strainers, or to pick the stuff in the beating engines, they are required only for fine paper.

Our rag cutters work from 8 a.m. to 6 p.m. in summer; in winter they leave off at 4 p.m., then we have more hands; now many prefer field work; they always have an hour for dinner. They have generally very good health. One who died recently was more than 60 years of age, and had never been absent for illness in 27 years. They do cut their fingers from time to time, but I have never had any case of mortification nor any serious wound from that cause where I have been.

The boys now and then have the tips of their fingers taken off by the horizontal cutter; that arises always from great carelessness or even from mere play.

The plan of day and night turns for men and boys has been substituted throughout these works for that of the 24 hours' journey. I have found all of them much more fit for work since that change has been effected. Before it, when we worked for the 24 hours, I used continually to find them all asleep at their work when I came in at night. No accidents ever happened in consequence, but there was much loss and waste.

46. *Jane Horsman.*—Am 14; work from 8 a.m. to 6 p.m.; began to work at paper mill three years ago, was 11 then; cut rags there as I do here; worked the same hours as now; there were seven or eight there quite as young as I was, some were younger.

[This girl was reading a letter to her mother when I spoke to her, it being the dinner hour; her finger was tied up, but her mother said that she had never cut it before, and it was nothing serious.]

[47. Of the six lads whom I saw, three could read, and the other three knew little more than their letters.—H.W.L.

MR. G. F. BUSBRIDGE, EAST MALLING.

149 persons are employed here; 87 are females; three boys and one girl are under 13; five boys and 19 girls between 13 and 18, the youngest is 9 years and 9 months old. After going over these mills with Mr. Busbridge, I drew up and submitted to him a statement founded on the information there given to me, which he returned corrected in the following form:—

48. There are no children employed at the rag engines during the night; there are two boys, one aged 9 years and 9 months, and another 13 years and 3 months, who pick the pulp, but they never work longer than from 7 a.m. to 6 p.m., and that neither continuously nor laboriously. Where children work of an evening, it depends entirely on the man under whom they work whether they have, more or less, of rest and comfort. The proprietor of this mill prefers having only male adults then.

In the machine room there are six boys, the youngest of whom is 12 years and 10 months old; their ordinary hours are from 6 a.m. to 6 p.m., they have occasionally to come at 4 a.m., but taking the whole year round they will not average more than the 72 hours a week. The machines are only worked by day, and not night and day continuously, so that it is very difficult to give a fair statement of the extent of their overtime; for although three boys are always in daily attendance at each mill in case that they might be wanted, it frequently happens that only one is actually at his place; the others may be reading, or

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cleaning up, or fetching the man's meals, or having nothing to do. The fact is, that in the machine and engine rooms of a paper mill the work is in no way continuous for man or boy, though they are paid for all the time during which they attend. For example, the boy Albert Smallwood appears from the wage book to have been paid since the beginning of this year for five weeks of 80 hours a week, one of 85, three of 90, two of 92, and one of 100; in others only 70, 60, or 50. Now it is very probable that he has been at the mill, when business has been pressing, during 15 or 16 hours in the day, and paid for that time accordingly, but that does not represent the hours he was at work, for half the time, probably, he was not working at all; and when the machine is stopped, as it frequently is for repairs of one kind or another, and also to mend the felts or wires, or merely for changing sorts or sizes, he may help the man by fetching or carrying something, but otherwise would be resting.

The last-mentioned cause of stoppages is one which affects mills that vary very much in the kinds of paper produced, and execute small orders or limited quantities of peculiar or particular paper much more than those who make nothing but news or printing paper for large orders or for a constant supply, and may work 48 hours and more without one change.

One cause, which to some extent necessitates working in the machine room beyond the usual hours, is that the pulp must be worked out in the day which our rag engines produce in the 24 hours, or else the supply would accumulate and be in excess; and the time for working the stuff produced will, of course, depend on the thinness and the making width of the paper on which the machines happen to be engaged; the engines for producing pulp being inadequate to supply quantities for keeping the machines continuously at work for 24 consecutive hours.

With regard to small orders, and especially for coloured papers, no doubt something may be done by getting early information as to what is likely to be in demand, but that is very difficult to obtain, and making to stock instead of waiting for orders is a kind of speculation that does not always answer.

The girls in the glazing room work usually from 8 a.m. to 6 p.m., but for about 10 weeks in the year they come at 7 a.m. and stay till 8 p.m. on five days of the week, that occurs sometimes for two weeks in succession; they leave at noon on Saturdays. They will have out of those 13 hours two hours for their meals. The little girl of 12 who helps never works longer than from 8.30 a.m. to 5.30 p.m., and has her dinner hour out of that time.

It is in this room that most of the girls under 18 are employed; three of them are folding envelopes, and eight are at the rollers, but there are no children so engaged, and two older girls are preferred instead of three young ones; a wad is placed between the two, and one takes the plates off and refurnishes it, while the second removes the sheet of paper, so that the third girl who used to lift the plate off is dispensed with.

> [49. Three boys whom I tried here could read fairly; one could not tell me the number of the Apostles, or of the Gospels, or the names of any until helped.]

MESSRS. HOLLINGWORTH AND CO., TURKEY MILL, MAIDSTONE.

Total number employed, 375; under 13 years old, 8 boys; above 13 and under 18, 16 boys, 26 girls; over 18, 62 men, 263 women.

The following statement, embodying the result of my interviews with the Messrs. Hollingworth and their foreman, was read over by me to them, and approved of by them.

50. Superfine paper for writing, drawing, and account books is made here.

There are about a dozen different branches of work in the mill, and the hours of work differ in all. In the engine room, where there are six men and four lads, they work in shifts of 24 hours on and off, half of them in each set; there must be one man and one boy awake through the whole night, but they are not all five needed at the same time, so they take turns of watching through the night.

In the machine room the usual hours are from 5 a.m. to 8 p.m., but as all the boys are not always wanted to be present during the whole day, the spare boys are sent home at breakfast time, about 8 a.m., and do not come on again till 5 or 6 p.m., when they relieve the younger ones who have been at work since 5 a.m. These and the older lads, who are not relieved in this way, occasionally work till 12 p.m., and sometimes all night; perhaps on an average once a week till 12, and once in three weeks or a month all night.

In the glazing room, where all employed are females, work goes on from 7 a.m. to 9 p.m. for nine months out of the 12. The carriers, *i.e.*, those girls who have to take the wads to and from the glazing cylinders, are frequently relieved at about 5 or 6 p.m. by others from the rag house, where the hours are from 8 a.m. to 5 p.m.

At three "hot rolls" the work is continued through the night for two nights in the week on an average, the work being so arranged and distributed as to prevent such night work being repeated more than two or three times in any one week. Each "hot roll" has four females attached to it, three working at a time and one to relieve; the time and order of relief they arrange among themselves, varying from day to day at their own pleasure. There is also a supernumerary woman, making in all 13 attached to these rolls. Two must always be working at each roll, one to feed and one to take out; but the third, "the jogger," who carries off the sheets, can do so for all three rolls, and thereby enable the other two "joggers" to take some rest while working in the night. During that time also the steam engine is shut down for $1\frac{1}{2}$ or 2 hours.

In the sizing room also, where all are females, the hours are from 5 a.m. to 5 p.m. These have to lay the sheets on the endless felt for the purpose of being carried through the sizing trough, or to remove the sheets from the felt, and part them after sizing.

All driving tackle and cog wheels are fended; a wooden beam also is placed close in front of the glazing rollers so as to allow of the wad being passed underneath, but preventing the hand from going with it. The latter plan was adoped in consequence of a woman having had her finger torn off through slipping in between the rollers. At the rollers for single sheets also a small donkey roller was used for the same purpose.

The Messrs. Hollingworth both stated that, if they could do as they liked, they would never have any under 14 years old employed on the place, but by the rules of the men they were allowed only one apprentice to each machine, or three in all, as theirs was a "carded"* mill. Consequently they were compelled to send away all their boys except those three, as soon as they were 15 years old, or in other words, as soon as they began to be useful. They would much prefer to keep them on, instead of having a constant succession of fresh hands, whom in effect they were training for journeymen's wages in the uncarded mills, and in whom they could not take the interest they would like to take, because that the short term of their employment, and the frequent changes consequent thereon, made it impossible.

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* Where all the males above 15, except apprentices, have a "card," or certificate, required by the trade union, of having served an apprenticeship to a "legal" master; as opposed to an uncarded mill or "scow banker."

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51. *Thos. Cornish.*—Am 14; have been here a year; have often worked 24 hours all together; have worked 36 hours right off; have done so about six times; have four hours' rest during the night when I have worked all night through; two hours at a time. work at the cutter, catching the sheets. There are four of us to catch when three sheets are cut; that's how we manage to lie down and sleep, there's one extra one.

[Reads well.]

52. *W. Weedon* (at cutting machine).—Am 11; was 10 when I came; have worked all hours, often 24; don't know how often. Was beginning to learn geography at school when I left to come here, but recollect nothing of it now.

[Reads fairly.]

53. *Thomas Box.*—Am 14; have been here near three years; sit up at back of machine and watch if the paper breaks; can't say exactly when I come to work and leave; come sometimes at 6 a.m., sometimes at 4 a.m., and leave sometimes at 8 p.m., and sometimes at 10 p.m., and sometimes go on all night; have worked several times all night and next day too, 36 hours; am very sleepy and tired when I work all night; get about two hours' sleep at midnight, and again sometimes.

[Reads fairly.]

Mr. W. Simpson, Stocked Lane, Tovil, Maidstone.

76 persons are employed here, only 8 are females, these are all adults; of the males 4 are under 13 the youngest being 11 years and 10 months; 14 are between 13 and 18.

54. *Mr. J. A. Simpson.*—What we make here is paper for printing. We use straw for this purpose; that is cut by men with a chaff-cutting machine, so that we have no women for rag cutting.

Our men work 24-hour shifts, from 3 a.m. on Monday to 8 or 9 p.m. on Saturday; the boys work only 12 hours at a time, for we don't think it right that boys should work so long as 24 hours, so those who work by day in one week are on the night turn in the next. One of the older apprentices, however, might occasionally have to take the long shifts of 24 hours if the man happened to be absent.

Boys come to work at about 12 years of age; if they are sharp we apprentice them at 14 to learn the whole trade; they stay in the machine room till they are about 17, then go for two or three years to the finishing room, and for the last year or so to the rag engine.

I should say that the stoppages from one cause or another amount to four or five hours in the 24, taking one day with another. Every five weeks or so new felts and wires have to be put in, that involves stopping for 16 hours or more. The lads have to get their meals as they work, and are allowed to manage the time with the relay boys as they like.

We have a shaft over the drying cylinders to carry off the great heat, but no fan in the roof; for when the room is high the effect of a fan is to condense the steam, and so to make the room and everything in it clammy and miserable.

In the last 14 years we have had only five accidents; none resulted in death; the most recent was four years ago, when a man who was oiling was caught by his slop by a shaft overhead; no bones were broken, but it was a very near thing; if a lad had not been there, as our rule is, to keep a look-out, and he had not got the machine stopped at once, he would have been killed; as it was the front of his body was completely flayed; he was away from work for three weeks.

No machine in any paper mill is driven at a speed at all like that of machines in cotton mills; 140 revolutions a minute is the fastest we ever work; that is the speed of the beating engines. The very outside rate for the paper to pass over the cylinders is 80 feet per minute; few mills run faster, the greater number slower than that.

I am quite sure that the work is better done if the place of work is made reasonably comfortable. Skilled hands will always choose such a place; we have known of men who were offered 2*s.* a week more than we give, but preferred to stay with us on that account. One said he knew he should spend 3*s.* a week in doctor's stuff if he went to this place from which the offer came, and so should be a loser after all. Our men are very healthy; some have been 14 years with us and have not lost two days on account of illness.

Christmas Day and Good Friday are always holidays with us, and either Easter or Whit Monday, sometimes both.

I believe that all our four boys who are under 13 can read and write. I used myself to teach in the Sunday school here, and know something about the education of the children. I know Lancashire well, and from my knowledge of working children there and here, I should say, that though the latter are sharper and quicker, there is more of what may be called book learning among those in this neighbourhood.

[One boy, aged 12, could read only monosyllables.]

Messrs. H. Allnutt & Son, Tovil Mill and Ivy Mill.

121 persons are employed here; 77 are females; four boys are under 13; three boys and seven girls between 13 and 18; the youngest are twin brothers, 10 years and 10 months old.

55. *Mr. Allnutt, jun.*—We only make coloured and fancy papers (not tissue) for covers of publications, albums, cheques, and the like. There is nothing in any way deleterious in any of the colouring matter; nearly all is vegetable.

The females here work from half-past 7 or 8 a.m. till 5 or 6 p.m.; the males from about 6 a.m. to 6 p.m. Our apprentices never assist the "engineers;" those do work 24 hours through, but they are adults. We have no need to work at our paper-making machine longer than from 6 a.m. to 6 p.m., for in that time we can work up all that our beating engines can do in the 24 hours. Our machine does not work very fast; some kinds of paper may be made three times as fast as ours.

If we had twice as many beating engines as we have, and wished to keep them all going without having any more paper-making machines, we should have to work the latter night and day also. Night work at making paper is a mere question of the proportion of beating engines to paper-making machines. My father has always had a strong dislike to night work; the men get sleepy and careless; and, as a consequence, the loss from damage to material or to gear, which probably would not have happened in day time, is considerable.

Our cutting machine and even our drying cylinders are separate from the machine where the paper is made. We can always cut at this machine in 12 or at most 13 hours as much as all our machines make in the day. The cylinders ought not to be away from the other part of the machine, but we were forced to make the best of the premises which we had.

Some of our women have worked for many years for us. I am not aware that the dust is injurious. There is often a scarcity of hands; some leave us after a short time. I have heard complaints of the flue where rags of the finer sort are cut as being worse than that of the inferior kind which we use.

56. *Mrs. Hoare.*—I have been a rag cutter for two or three and twenty years. I think my health has suffered: it is the dust that is bad; it hurts the chest;

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you have to take medicine for it. There is my daughter, too ; it affects her in the same way ; I can't exactly say in what way, more than I have.

57. *Mrs.* —— (daughter of last witness).—I have cut rags for about 12 years ; it is not good for me ; it hurts the chest ; you don't notice it after a time, and after a week's holiday you get much better. I was away for several days a fortnight ago, and got much better, but when you come back again you feel it very much at first ; it was because of my chest that I was away. I have had to be absent several times on that account ; I am married, and have a family.

58. *Mrs. Abnet.*—The dust of rag cutting never hurts me, and I have been at it 30 years ; it does hurt some constitutions, and agrees with others. I have found that foreign rags always make me sneeze very much ; they give one quite a cold ; that goes off if you stop at home for a day or two. The younger women always suffer a good deal when they first come to the work. Though I have not been hurt myself, I think that rag cutters and sorters are less healthy than the women hereabouts who work at home or in the fields.

59. *Mrs.* ——.—I am now sorting paper ; that is much better than sorting rags ; I did that for some years. The dust used to get on my chest ; I took opening medicine for it once a fortnight ; that is what most do ; I don't know that I am any the worse for it now.

Messrs. Macey and Elves, Medway Mill, Maidstone.

60. *Mr. Macey.*—47 persons are employed here ; 18 men, 16 women, 13 lads of ages from 11 to 16. We make brown paper and other wrapping paper ; coarse rags, rope, bagging, and the like are cut up for that. The boys at the dusting and sorting have 10 hours of work, and an hour and a half for meals, making 11½ together; at the machine and the rag engines they work day and night in 12-hour turns from 6 to 6, with 18 hours on Saturday and 6 on Monday to make the change of turn. It is possible that a lad might go on for 24 hours, if his mate who ought to succeed him happened to be ill, but as a matter of fact that does not happen once a year. These all get their meals at their work. I do not like the system of 24 hours on and 24 off. I am sure that whatever it may be for the man, it is not good for the employer. I always find that when a man takes his mate's turn after his own, as may occasionally happen, the second 12 hours is not worth much to us. We pay the boys 4*s.* 6*d.* a week when they first come, and raise it by degrees to 6*s.* and 7*s.* I fear that several cannot read, and have had very little education. It is in every case, I believe, owing to the neglect, not the inability, of their parents to send them to school.

[61. Out of six lads four, aged respectively 11, 12, 16, and 18, could not read ; the one aged 16 had been to a day school for a year, the other three only for a month or two ; they never went to evening school.]

Messrs. W. and R. Balston, Maidstone.

382 persons are employed here : 264 are females; six boys are under 13; eight boys and 23 girls between 13 and 18. The youngest boy is 8 years and 11 months, the two next youngest 9 years 5 months and 9 years 7 months old.

This mill (which is of recent construction, an older building having been destroyed by fire,) is, in respect of its sanitary arrangement, worthy of all commendation. The rooms are spacious, clean, and well ventilated, and many contrivances are adopted to lessen the labour and promote the well-being of the workpeople.

62. *Mr. W. Balston.*—All our paper is made by hand ; what we make is the best writing paper and drawing paper ; the hand-made paper in those kinds are acknowledged to be very superior to any that is made by machine, and fetches a far higher price. The same process is in operation with us for paper making as has been used for the last 100 years ; the large stone vat, holding the fibre or stuff, into which the mould or frame is dipped afresh for each fresh sheet of paper, remains with all its accessories but little altered so far as we are concerned.

We do, however, use steam power, chiefly for the "engines" which grind and beat the rag into pulp, but also for the presses in the vat room used to press the sheets, after they have been placed between the felting or blankets when turned out of the mould, and for the glazing machines which give a surface to the paper after it has been thoroughly dried.

About one-half of the females whom we employ are cutting or sorting the rags ; we have, however, a considerable number who are engaged either in sorting the paper after it is made, and picking defects out of the sheets, or in the glazing room, where some place the sheets between metal plates so as to form the wads, while others push the wads under the cylinder of the machine.

We have no females employed here under 14 years of age, and prefer to have none till they are 16 or 17 ; if they are younger than about 14 they cannot be trusted ; they must, however, be young when they begin, for whether it be cutting and sorting rags, or picking and sorting paper, one who has learned young will do in the same time much more than another who began late in life. This early training is particularly needful for one branch of sorting paper, where they have to "part" or separate the very thin foreign or bank post paper sheet by sheet, as they are taken from the felts before being pressed.

The six boys, who are the only children under 13, are in the vat room ; they are brought by their fathers to help them when we are making thin paper ; their particular business is to "draw the slice," (a thin flat piece of wood covered with felt, and used to keep the bottom edge of the upper sheet from sticking to the sheet below, until the top and sides have been laid square). Sometimes we have none of them ; at others more than we have now ; their number depends on the number of vats at which thin paper is being made ; for a boy is absolutely necessary for the layer at those vats. They are glad enough to come, for they have 1*d.* an hour. We pay the boys ourselves ; that indeed is the case throughout ; we hire and pay all who work for us ourselves.

The eight lads between 13 and 18 are all apprentices. The number is limited by the rules of the union among the men. We may have one apprentice to each vat and one extra one for so many vats. The vats' crew consists of three persons. We have 14 vats and 15 or 16 apprentices. They are not bound by regular indenture. We have had only one formal binding in 40 years. The agreement is a verbal one. They come at 14 for seven years. They learn different parts of the work as they advance, beginning with helping the "engineers" to fill the rags into the troughs and watching the stuff as it is being beaten up. Then they go to "dry work," which is hanging up and pulling down the sheets from the hair lines on which they dry.

The hours of work are different for different branches of the work. The "engineer" and apprentice with him work a journey, 24 hours at a time, from 7 o'clock one morning till 7 the next. In the night-

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time we require that they should not both be asleep at once; the man ought always to be awake; but one sleeps while the other watches. Ordinarily the lad will have to feed each of the two pair of troughs with rags about once in every three or four hours, so that he would have to feed one every hour. It is necessary that this work should go on day and night, for otherwise, when the vatters come in the morning, and they come very early, at 5 a.m., they would have nothing to go on with. They consume in the day all the pulp that the engines can supply working day and night.

We have only one steam engine for all our motive power, so that stoppages of a length varying from ten minutes to one hour frequently occur in several parts of our works at once. The engine is almost always shut down at noon for the dinner half hour, and again at 7 p.m., unless they are going on in the glazing room until 8 or 9 p.m. At 4 a.m. also it is shut down for about three-quarters of an hour.

The men, who come at 5 a.m. often, when they are on the larger kinds of paper, get all their work over by 1 p.m., for that is heavier work. On Saturday they generally get away by about 10 a.m. Now and then a vat's crew will not come for a day; they will then work longer than usual to make up for the loss of that day, but scarcely ever after 6 p.m. Sometimes also, when a different coloured paper has to be made and the chest must therefore be worked out first, they may do so.

The work of the rag cutters is limited by the length of the day, for we will not allow gas or any kind of artificial light to be used where they are for fear of fire. The glazing and paper sorting rooms are the only places where they have gas.

Many of the women are married. These often get substitutes if they want to stay away for a morning or a day, or to leave early. It is in the glazing room more especially that this takes place. A neighbour, or perhaps a girl from the rag room upstairs after her work is over, is glad to come down and earn 2*d.* an hour there.

Since your first visit to our works we have made a regulation that none of these girls under 18 shall work more than 12 hours a day here, whether at the same or at different kinds of work.

Accidents to the workpeople from the machinery are very rare. I have never known any to arise to the girls at the glazing machine. Only one roller moves, and the "wad" of paper and plates is put under it without being taken off the little tray or carriage on which it is wheeled along the table up to the machine. Five or six years ago, a man passing where he had no business to be, was caught by some part of his apron as he stepped across a shaft, and was killed. Most of them take their meals on the premises.

We have always endeavoured to encourage a good moral tone among our hands, and I think we have met with success. All promise when we engage them to attend some place of worship on Sunday; and with regard to the women we inquire from time to time whether they do so. All the younger ones have, I believe, been to school before they come. The apprentices often attend a mechanics' institution in the evening. The good of night schools for young women is, perhaps, doubtful, at all events in a place like Maidstone. We have hardly one man who drinks in our employment.

The vatting room is necessarily warm. I suppose on an ordinary day it is at summer heat; on hot days of course it will be higher; but we do not find those who work there less healthy than the rest.

I have sometimes thought that the working 24 hours at a time might be injurious to the engineer and his lad, and have proposed 12 or 18; but they all like to have the whole of the next day to do as they please, and certainly I cannot say that their health suffers. There are, however, only two lads who work in that way in all our place.

I must say that I think the half-time system, children working by relays for half the day, and going to school in the other half, is applicable, and would work well for slice boys. If, as is generally the case, they do not go to school when they have once begun to come here, after an absence for two or three years they do not like to go at all, and so forget what they have learned before.

Good wages are earned with us. Apprentices have 6*s.* a week from the first, and a lad of 18 or 19 has 15*s.* or 16*s.*

63. —— *Sharp* (foreman.)—A day for day workers is considered to be from half-past 7 a.m. to 5 p.m. for women, and from 6 a.m. to 3 p.m. for finishers and dry workers. All others are paid by the piece, so they work between the hours of 5 a.m. and 6 p.m. much as they please. Sometimes they may stay as late as 9 p.m., but not very often. There are three apprentices under 18, who are layers in the vat room. If the crew to which an apprentice belonged worked till 9 p.m., the apprentice would also; that happened once three weeks ago; it was because the stuff was not worked out. I don't recollect it ever happening so before. After our fire we had for some time to work in day and night shifts; that was over two years ago, and was the only time we ever did so.

The "raggers'" hours are from 8 a.m. to 6 p.m.; they are women. In the glazing room they are working now from 6 a.m., some may go on till 9 p.m.

64. *Clara Hyland.*—Am 15. Have been here about six months. Have worked many times from 6 a.m. to 9 p.m., part upstairs in the sol, and part down here; did so for three nights together a fortnight ago; was tired, but not so very much, nothing near so bad as dress-making; used often to work longer at that. Began that at 13 years old in Maidstone. What I do here is, I sit and take the sheets out of the wad after it comes from the press. Am often resting, as I am now, waiting for a wad to come back.

> [65. The forewoman of this room stated that they had three half hours for meals when they worked from 6 a.m. to 9 p.m.; tea being at 5 p.m.]

66. *William Weedon* (slice boy).—Am 11 years old; must have been here 2½ years. Have been at day school only at one time since then, that was when the fire here was. I got to work again in two or three months. Daniel was in the lion's den. Don't know who Joseph's father was, nor how he came into Egypt. Don't know how many brothers he had, nor what they did to him. Can't say how many Gospels there are. (Reads fairly.)

67. *George Benge.*—Shall be 10 next March; have been here a twelvemonth; so was 8 years and 6 months when I came. Am off work for about a day in a month, not more. Am a slice drawer. Came yesterday at 4 a.m., that is father called me at 4, began work at 5 a.m., and went on till 6 p.m.; that is longer than usual. Have not been to school since I came here.

> [68. This boy read fairly, but could answer no question correctly, either about the number of the Apostles, or of the Gospels, and their names, or from the multiplication table. His father was receiving 36*s.* a week, with 3*s.* 6*d.* extra as beer money, &c. as a "layer."
>
> Another boy, John Bailey, who was nearly 13, read well, and answered several questions intelligently and accurately; he went to evening school.]

Mr. John Burcham Green, Hayle Mill, Maidstone.

70 persons are employed here; 41 are females; two boys are under 13; four boys and three girls between 13 and 18; none are under 11 years old.

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69. *Mr. J. B. Green.*—We make paper by hand, chiefly bank notes, cheques, and similar kinds. We have four apprentices, two are under 18. This is a "carded" mill, so our number of apprentices is limited; the boys usually have been employed about the mill for some time before they are apprenticed, and practically serve from 10 years old to 21.

The young ones come first as slice drawers to help their fathers; they are wanted only when thin paper is made, and are not constantly employed; the "layer" is the member of the vat's crew whom they help, so he has the privilege of bringing his son before the others, if he have one. We have from two to four of each, according to the work we are doing.

There is no formal indenture, it is a mere verbal arrangement, and either master or apprentice may part at any time. In 25 years I have had only two apprentices who have turned out badly. 9*s.* a week is the least they receive, that is what they begin with, that is made up of 1*s.* 4*d.* a day, and 1*s.* for clothes; but they are often put on to 1*s.* 8*d.* a day in a very short time. This one, who is 14½, earned, you see, over 13*s.* last week.

The extreme of work for the vat's crew is from 5 a.m. to 5 p.m., and they are more frequently employed for a shorter time. All their work is over by 10 or 11 a.m. on Saturday. The only part of my works in which I think the hours are too long is the rolling room. There it is a common thing to work from 6 a.m. to 8 p.m., except on Saturdays, when they leave at 11 a.m. There are one or two boys there and six or seven young women from 18 to 25 years of age. The length of hours is caused by our having only one pair of glazing rollers, we ought to have two.

Two girls are employed in the sizing room, one aged 13, the other 15; that is where the long trough and endless felts are; their hours do not average more than 40 in the week, and never exceed 50, but that place is too hot for them; if it does not injure their health directly, it makes them very liable to take cold, unless they are careful. I have had most of the women who work in that room protected by a partition, which separates them from the part where the trough is; but the two I have mentioned must stand in the heated atmosphere, one at each end of the trough, to lay on or take off the sheet. The man who is there can tell you the amount of heat and the reason why it cannot be otherwise. (No. 70.)

I fear that it is the case that in paper mills children are often employed younger than they should be. Their education is, as a consequence, too often very defective, and sometimes wholly neglected. I, myself, wish that the law would step in and make education up to a certain point compulsory on the employers or the parent.

I think it wrong that children should work 12 hours by night. When a mill is working night and day, it would be a good thing, in my opinion, to limit the time to three shifts of eight hours each; but the absolute prohibition of night work would be absolute ruin to many branches of the trade.

70. *The man in the sizing room* stated that the temperature of the room was commonly 90°, and at times 100°; that of the sizing liquid was 120° on the earlier days of the week (before the steam pipe which passes through the trough is coated with a deposit), and sinks to 110° towards the end. Openings had been made in the roof for ventilation; but they had to be closed, because the air which they admitted chilled the size, and thereby caused a coagulation, which, however slight, wholly prevented it from working properly. One of the two girls had been employed for 10 and the other for two months in that room, but neither had been absent from illness attributable to the great heat.

71. —— *Gigger.*—I have gone through the whole thing from being a slice boy and afterwards an apprentice. My two younger brothers, who are here now, begun by being slice boys at 9 or 10 years old; it is too young, so far as schooling goes, no doubt. At most paper mills where they make by hand, such boys would be sometimes employed; they would be on for a fortnight or perhaps a month at a time, and then off for a week or more; for three months in the year, you may say, they are off work; that is in the winter, chiefly, because thin papers are not made so much then.

The vat's crew reckon their week's work to be seven days of eight hours. They often work from 5 a.m. to 5 p.m., but scarcely ever longer, and they leave at about 10 a.m. on Saturday. They have half an hour for breakfast at 8 a.m., and the same time for dinner at 12. In the rolling-room half an hour is allowed for tea when they work till 8 p.m. Occasionally there are night shifts with a fresh crew; we had to have that for some weeks two or three years ago. They would come on at 5 p.m. and leave at 5 a.m., or thereabouts.

When a lad is apprenticed here he begins at the lay stool at once; he does not "couch" (turn off from the mould) until his last year or so. There is no ill-treatment of apprentices or other boys now as there was once in the trade; the present generation is better off in that respect, I believe; they don't get knocked about as they used to be.

The slice boy has short rests from time to time; he goes on for about 20 minutes until a "post" is done; then the crew leave off in order to press; that takes about four minutes. 20 posts are reckoned to the day's work, or five in two hours. These boys are paid 10*d.* a day by Mr. Green, but 8*d.* is more common.

I believe that in some mills the vat's crew do work more than 12 hours on some days in the week, but that is only when they choose to make holiday at the first part, and have to make it up at the end.

72. *H. Gigger.*—Am 13; came here four years ago; was slice boy for two years; was off for about 10 weeks out of the year in that time; went to school in those weeks; used to work at that from 5 a.m. to 5 p.m. mostly; never longer. Then went to wetting out in the size room; that was from 6 a.m. to 5 p.m.; after that to the rolls; am there now; we work from 6 a.m. to 8 p.m.; that is long, but it is all easy work. Have no time for any reading now; know nothing about the names of persons in the Bible, or the countries of the world.

[Reads fairly.]

73. *C. Gigger.*—Have been six years here; am 16; am an apprentice; worked in night shift about three years ago with vat's crew, every night for three weeks. That has never happened since. Don't like night work; can't get your rest so comfortably in the day. Used then to leave work at 5 a.m., and go to bed till dinner time, about 1 p.m. Have had very little schooling.

74. *James Bourne.*—Am 14½ years old; was between 9 and 10 when I came here; am apprenticed now; for the first two years was drawing slice, and throwing felts, and now and then taking off sheets at the rolls; so was very seldom off work. Now I "lay" the sheet, that is, take it off the felt and lay it in the pack; "laying" is back-aching work, if there are two sheets on each felt; when there is only one you don't have to work so fast. Shan't come to "couching" till my last year. I found the hours in the rolling-room, 6 a.m. to 8 p.m., not exactly tiring, but very wearying, for there is no change. I read of an evening, and write in a copy-book sometimes.

[Reads well.]

75. *Thomas Lewis Sells.*—Am 12; have been only a few months here; I draw the slice; sit to do that; have been throwing felts for the last two or three days; have to stand for that; it makes my back ache; have only done it once before. Worked from 5 a.m. to 5 p.m. yesterday; came at 4.30 a.m. this morning, but expect to have done that by about 12. Jacob was a man with a coloured coat.

[This boy did not know all his letters, and could not read the words "love" and "Lord;" he answered several questions about the circumstances and reason of the death of

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our Saviour with tolerable correctness, and stated that his sister at home taught him that of an evening sometimes, but that he never went to school.]

76. *Alfred French.*—Am 11; have been here since a little before last Good Friday; am a slice-drawer; am sometimes off for a day, sometimes for a week; was once off for three weeks together. Think I have worked rather more than half the time since I have been here. When I first came I used to be here for ever so many mornings at 4 a.m.; once I came at 3 a.m.; often worked on till a little past 5 p.m., but never after 6 p.m.; our usual time is from 5 a.m. to 5 p.m. We take our meals here.

Have rests about every 20 minutes for three or four minutes; sometimes have to "squeeze" them, if there are two sheets together between the felts, such as foolscap or copy.

Read the Bible at home of an evening to grandfather.

[Reads well.]

Bucks.

BUCKS.

Messrs. Grosvenor, Chater, & Co., Wooburn.

117 persons are employed here; 52 are females; three boys and five girls are under 13 years of age, only one being under 12; between the ages of 13 and 18 there are 18 males and 10 females.

77. *Mr. Wildes.*—I reside here, and have the management of the paper-mill for the firm. We are very short-handed just now, especially in the rag room, and have therefore more boys than we should have or have had hitherto. That is caused by the existence in this district of other occupations for women which can be carried on at home, those of lace-making and shoe-binding especially. Men and boys are also employed in chair-making.

The usual hours in our rag house are from 8 a.m. to 5 p.m., with an hour for dinner; the doors, however, are open at 6, and any who choose can begin work then, but the younger ones seldom come before 8; none stop after 5.30 p.m. The supply of females is so limited here, that we have not only to employ boys to cut rags, but are glad even to put men to that work. All is piecework, and one will earn 8*s.* or 10*s.* a week, while the next one will not take more than 3*s.* or 4*s.*

The lads at the rag-duster and at the cutters work 24-hour shifts; they always manage to have some time for rest during the night. At the former he might lie down for two or three hours together; for the man feeds the duster,* and the boy's business is to collect the rags when they have been dusted, and carry them in a basket to the rag boilers; that would be done about once every 12 hours, for we boil 15 cwt. at a time. The boiling occupies about eight hours, and the filling and emptying four. We intend to dispense with that carrying off in baskets, by having an endless felt passed under the lower orifice of the duster to catch the rags and take them at once up through the floor into the room above where the boilers are.

Those at the cutters also have similar opportunities, for our cutters are detached, and can cut seven reels at once, so that they might be lying down while three or four reels in succession came off the paper-making machine. We have no definite rule which we enforce as to this, but leave it to the men and boys to arrange among themselves. We usually cut five reels at once, and never into more than three sheets. We reel 2 cwt. on each reel; that takes about three-quarters of an hour; what we make is book printing paper. Every cutter has two boys attached to it, and there is always a third, rather older, who attends on the machine man, so that if only one sheet is being cut, the two boys can take turns one with the other, or if two or three sheets, the third boy can relieve either of them; but they may possibly be all wanted at one moment—to assist, for example, in the case of a breakage,—and therefore must all be on the spot, though, as a matter of fact, they might go on for a week and more without any such occurrence.

Breakages of paper are however very common, and the value of a good machineman may be said to consist chiefly in the art of so regulating the speed at different parts of the machine as to prevent the paper, on the one hand, from becoming so attenuated as to be unable to sustain the pull of the cylinders, and on the other hand, from expanding laterally, and thereby being wrinkled as it passes over them.

I think accidents in paper mills are much less frequent than they used to be. One reason probably is that machinists arrange their wheels and driving gear, and especially the glazing rolls, better now. Here we have no wheels at all on the side of the machine where any one passes, and even on the other side we box all we can. These two large wheels and pulleys must be left so that the man can get at them, for the speed at different parts of the machine depends on the relative proportions of the circumferences of those wheels, and he has to put on or take off a piece of the felt round one in order to alter that proportion. Accidents do happen in doing so; but I do not recollect any accident here which arose through want of fencing. The most serious we ever had was when three men were very badly scalded, through their own neglect, by the escape of steam from the rag boiler. Two others took place at the rollers; the fingers of one boy, and the arm of another, were badly squeezed in putting the paper through; the arm was not broken; in the other case the top of the forefinger was.

None of our women work, or have any business to be, where there is any machinery; but still, for fear of danger, we allow no crinoline. I remember, not very long ago, a woman was killed in a paper mill through being caught by a horizontal shaft, which was thought to be quite out of harm's way, nearly on the floor and close to the wall. It appears that a steam pipe ran along the passage parallel to the shaft, and in stooping to get some hot water, with her back to it, her dress came into contact with the shaft.

Our machinery is oiled while it is in motion; we have adopted Marshall's lubricator for the wheels of the drying cylinder; that requires feeding only once a week or so; it consists of a grease cup fastened on a saddle over the axle of the wheel, and its flow is maintained simply by atmospheric pressure. At parts where it would be dangerous to go close, we have a long tube from above, down which the oil is poured.

I do not find that the health of the boys is injuriously affected by the 24 hours' work; they do not even seem to get very tired; one of them has been known to go from his work here home to breakfast, and then to school a mile and a half off on the alternate days.

We have a library attached to the works, and many of the boys take the books out; they are probably not accustomed to read aloud, and therefore might seem to you more backward than they really are. The prohibition of night work for children and young persons in our manufacture would merely entail extra expense in an increase of wages by employing adults in their place.

78. *James Nichol.*—Am 14½; have been here six months; was in the rag house for five months, and at the cutter for one; used to work in the rag house

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* A kind of large squirrel cage laid on a slope with spikes inside.

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from 6 a.m. to $5\frac{1}{2}$ p.m., never later; the dust hurt my chest just at first; haven't worked yet the 24-hour shift at the cutter, because of the alterations. The cutter always stops for breakfast and dinner, half an hour for each. Can't do any sums. Have never been to day school since I was 7 years old; was there for a year before that. Have been in the fields minding pigs and sheep, and at shoe-making. Go to Sunday school; know about Pharaoh in the Red Sea; not about Elijah, or Naaman, or Daniel. (Reads fairly.)

79. —— *Nichol* (machine man).—Am father of the last witness; have been at the work from a boy, and always worked the 24 hour-shift; I think that is much better for health and comfort too, than working 12 hours on and 12 hours off, day one week and night the next. You get home after the night turn at 6 a.m., and have to go to bed when every one else is stirring about, and there's noise in the houses and noise in the streets, and you can't get any real rest for the whole of the week, when you are on the night turn. But if you have 24 hours off, you have plenty of time for sleeping in the night, and reading or taking exercise in the day. I think it is better for the boys as well as for the men. They always have some hours' sleep in the night; one often lies down soon after supper, at about half-past 10, for an hour or two; the cutter can cut seven, and often cuts four or five reels at one time, so that they can rest for two hours or more at a time, until several reels are ready for cutting. It takes about an hour to fill a reel.

80. *Henry Hazell.*—Am 14; have been here a year; am in rag house now; was at cutter first; liked that best; the 24 hours never hurt me. The cutter always stopped for supper, if we were on two sheets.

[Read and answered all questions very well.]

81. *John Prior.*—Am 14; have been here four years. Was first in rag room; then went to the cutter and laid sheets. Am now polisher, that is, I clean parts of the machine, and lend a hand as I am wanted. Laying sheets is easiest; you sit, and take them off the felt. I clean different parts, the cylinder frames for instance; the machine is in motion while I clean them. Once I got caught. I was rubbing part of the cutter, and the wiper got between the cog wheels, and my little finger was drawn in and broken. Went to day school from five to eight years old. Went to night school the winter before last twice a week. Go to Sunday school. Can't tell you who Pharaoh was, or what happened to him, or what country he was king of. Don't know the names of any Apostles or Disciples, nor how many there were.

82. *Edward Whitney.*—Am 15; have worked here four years; was at the rag duster for the first year. Used to take the rags from the end of the duster, and carry them in a basket to the rag boiler. Now I am at the cutter. I like that best because it is not dirty. The hours were the same at the rag duster as they are at the cutter, 24 on and 24 off. I come at 6 a.m., breakfast at 8, and have dinner at 1. The cutter stops for half an hour at breakfast, and sometimes for an hour at dinner. It does not always stop for tea or supper. If we are cutting one sheet, it doesn't, because there are two boys to the cutter, and one can lay the sheet then, while the other has his meal; that is how we manage at night too about sleeping. The man lets one lie down for an hour, and the other lays for both. I have supper at about 10 p.m., and lie down and sleep from 12 to 1 a.m., and from 2 to 3 a.m.; the other boy has from 1 to 2, and from 3 to 4. I never lie down before 12. I don't get very sleepy. At 4 a.m. we get a drop of tea and a wash, that refreshes you very much. Then I go off home at 6 a.m., and go to bed. Never learnt any geography. Don't know what an island is. (Reads fairly.)

MESSRS. THOMAS, STEPHENS, AND GREEN, WOOBURN.

86 persons were employed in this mill; three boys were under 13, the youngest $10\frac{1}{2}$. Between 13 and 18 there were 10 boys and three girls. There were 10 female adults.

83. *Mr. Thomas* stated, that straw was the material used for the manufacture, which consisted of news and printing, and also writing paper. The boys work in 12-hour shifts night and day in alternate weeks.* Most of them, 10 out of the 13, were employed in the machine room, there being four to each of the two cutters, so that if three sheets were being cut, there was one boy to relieve, and therefore a rest of about half an hour in every two hours, or one hour in every four, according as they chose to arrange it. Occasionally, but very rarely, one boy would take the turn of another who was ill, or wished to be absent, and so would work on through the double shift of 24 hours. Such a case had occurred in the week before my visit. It would be a very extraordinary occurrence for both machines to be making three sheets night and day at the same time. The females in the sol occasionally worked from 6 a.m. to 8 p.m. This would happen more often than once a month, but less often than once a week. Their usual hours were from 8 a.m. to 6 p.m., and sometimes 8.

84. Accidents having occurred through boys getting their fingers caught in the rollers of the machine between which the paper passed out to the cutter, a board had been screwed close across the front of each set so as to prevent the hand getting between them; we found, however, one of them only loosely hung on with string.

85. Three boys, two aged 12 and one 14, read fairly: the youngest of them, who said he went to Sunday school, could tell me nothing about Pharaoh or Joseph, nor the name of the Apostle who betrayed Christ, or of any one of the Gospels. He had been at the mill for five months, and had been minding sheep before, but had been for two years to a day school. The two other boys answered some questions in Bible history correctly.

MR. W. W. MORLEY, LOWER MILLS, WOOBURN.

76 persons are employed here in the manufacture of millboards, all are of the male sex, 12 being under 13 years of age, and 14 between 13 and 18.

86. Of those reckoned as under 13, four said they did not know their ages. The youngest of all was not quite 9 years old, he had been there a very short time.

87. Most of the boys are employed in sorting waste paper or cutting rags, and carrying material in sacks from one room to another. From this some are drafted up to the machine room as they grow older; their occupation then being to take the sheets of millboard, as they are formed, off from the reel at the end of the machine, and to lay them in piles on a kind of tressle, whence they are removed by men, and dried in the open air. Most millboards, however, are made by hand in a mould similar to that used for writing paper. This is very heavy work, and none but adults were employed at it. The lads also assist in laying out the boards to dry.

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* Only one machine was being worked day and night at the time of my visit.

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88. *Mr. Morley* informed me that though he used a water wheel, he considered that a mere nothing, and looked to steam alone for his motive power. He mentioned to me one case of a boy who had put his finger between the cog wheels of a machine, and another in which a lad, who was feeding the rag chopper under his father's eye, lost two fingers through pushing his hand too far forward with the rags along the trough to the revolving knife.

89. The ordinary hours of work are from 6 a.m. to 5 p.m., with an hour and a half for meals. 10 minutes' grace is allowed in the morning, and if any are not in by that time, they lose a quarter day. In addition to the half hour for breakfast, another quarter of an hour before that meal is devoted to daily prayer, at which all the boys and most of the men attend regularly. Mr. Morley stated to me that he found quite as much work done in the day, since this extra quarter of an hour had been given up for the purpose, as was ever done before. On Saturday work ceases at 4 p.m.

90. The utmost extent of ordinary overtime is until 7 p.m.; this occurs three times a week for about 40 weeks in the year. Gas is fitted up in glass lamps at the sides of the rag house, so that the work can be continued there, as in other parts of the mill, after daylight is gone. The 24-hour shift exists here at one of the rolling machines, where a man and a lad of 17 are employed. On very rare occasions work has in some departments been prolonged from 6 a.m. to 8, and even 9 p.m., but no children stayed so late.

91. All but about 12 (who are adults) are paid by the day. The boys, who begin at about 10 years old with waste-paper sorting, receive 2*s.* 6*d.* or 3*s.* a week. Those who "take off" at the machine have 4*s.* and 5*s.*; a boy of 15 at rag cutting, if expert, makes 8*s.* or 9*s.*; one at the rollers has 7*s.*, and another 12*s.*

92. Mr. Taylor, one of Mr. Morley's clerks, is accustomed to take all the lads employed there, half on each alternate day, for half an hour of their dinner hour (12–1), and teach them reading, writing, and arithmetic; sometimes this is varied by singing. A library also is attached to the mill for the use of the workpeople. 23 of the lads present at the mill when I visited it, were had up before me in two classes, to read to me. The first class consisted of 9, who were the older ones, most of them engaged either at the rollers or in the machine room. Each of these read a verse from Longfellow's poem of "the Reaper," which I selected from "the Training School Reader," a book which they were in the habit of using. Most of them read with comparative ease, and some even with correct emphasis and intonation. For the remaining 14 I chose a simple piece out of the Infant School Reader; six of these could only spell out their words letter by letter; the others read fairly. Of the six above mentioned, two had been two years at work at Mr. Morley's, the four others only a few months. The boy, who was under 9 years of age, was not one of these six. All said they had been to day school, before they had begun to work. Several of the older boys in the first class wrote a sentence on slates for me; some wrote a good hand; one lad of 18, who did not come up in class before me, was unable to read.

93. A very intelligent boy of 15, who had been five years at Mr. Morley's mill, and was one of the "takers off" at the machine, told me that he earned 6*s.* 6*d.* a week, when they worked from 6 a.m. to 7 p.m. for three nights a week, but they more often left off at 5 p.m. than at 7; he had sometimes gone on till 8, but very seldom. He said that he found it tiring to stand at the reel and take sheets off, when the pile was high, because then he had to reach so far to lay the sheets even. He was very well contented with his work, and said, speaking of those who, though they had been some time to day school, yet could not read to me, "If a boy means anything, he will learn to read in less time than they had at school." He thought that the older boys at Mr. Morley's had most of them been able to read a little before they came, but were very much improved by the pains taken with them.

MR. H. WHEELER, WYCOMBE MARSH.

At these mills 61 persons are employed, none under 13; 8 boys and 10 girls under 18; and 13 adult females.

94. *Mr. H. Wheeler.*—News paper is made here. In the engine houses, where the work is done in 24-hour shifts, none but male adults are employed. In the rag and shaving house the hours are from 7 a.m. to 5.30 p.m.; and in other parts, except at the machines, from 6 a.m. to 5.30 p.m. In the machine house work begins at 6 a.m., and though they sometimes shut down at 6 p.m., they generally go on till 10 p.m.; sometimes they are later, and for about 10 nights in the year work all night. Each machine has four boys attached to it; when three sheets are being cut, the fourth boy, who usually looks after the size, would not be wanted for that purpose, and would therefore take his turn to relieve one of the others at the cutter. When one or two sheets are being cut, the three boys relieve each other; the one who is not at the cutter may sometimes be cleaning up or going on errands for the man.

No boy has less than 4*s.* a week, some have 7*s.*

There are no regular holidays; if it were requisite, they would work on Christmas Day as on any other day, but they generally contrive to have a day's holiday then.

Those who leave at 5.30 p.m. have half an hour for breakfast and an hour for dinner; those who stay later have half an hour for tea.

In order to get any profit out of the trade we must work the machine more than 12 hours a day, and must employ boys to catch the sheets. The amount of overtime depends greatly on the thickness of the paper and size of the sheets; some kinds are as little as 13 lbs. to the ream (demy); some as much as 70 lbs.; the contents of the engines must be worked out, and though no doubt we work our machine at greater speed when we are on thin paper, it must obviously take much longer to work the pulp out in making reams of the former than the latter weight.

95. —— *Williams.*—Am 13; have been here a little over a month; was two years before that at another paper mill; used to look after the dryer there; had to draw the paper through, if it broke, and called the man, if I could not do it without him. Some of the other boys there got their fingers nipped by the cylinders in doing so, but I was more careful and never got caught.

Used to work day and night turns of 12 hours then, but like this better, for I could never rest properly in the day for the week when I was on the night turn. Here I work much longer, but I always get to bed at some time in the night and have several hours' sleep. Very seldom have gone home before 10 p.m. since I have been here, and generally come at 6 a.m.; came

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once last week at 4 a.m. and stayed till 10 p.m.; worked twice in the week before that till 1 a.m., and came again at 5 a.m. the first morning after, and at 8 a.m. the second. It is not at all hard work, and I am not always at work while I am here, for another boy takes my place, and I have my meals or do some other work, but I can't rest, and go to sleep, while I am here. Still I like this better than the night turns at the other place.

[Reads fairly.]

Messrs. Plaistowe, Brothers, Loudwater, Wycombe.

96. At this mill 42 persons were employed when I visited it; only 6 were females, and they all adults; 8 boys were under 13, the youngest being 10, and three between 13 and 18; these 11 were employed in sorting paper shavings, or as rag cutters; their hours in the summer were from 6 a.m. to 6 p.m., and in winter from 8 a.m. to 4 p.m. The paper-shaving sorters earned about 2*s.* 6*d.* and the rag cutters, of whom there were very few, about 3*s.* 3*d.* a week. Three or four more boys were usually there. Water was the sole motive power; the paper was reeled off from the machine, and cut by hand; this was the work of male adults.

97. Out of 6 boys between 11 and 14 years old not one could read, even fairly well; most only spelt out their words letter by letter; one, who was selected as the best reader, spelt aloud every dissyllable before pronouncing it.

Mr. C. Venables, Taplow.

98. *Mr. Venables,* who took me over this mill, stated to me that he had only eight persons under 18 years old in his employment. These were lads in the machine room at the cutter, &c., and worked in 12-hour shifts night and day, four on and four off. He wholly disapproved of the 24-hour shift, saying that as to boys "it stands to reason" that it could not be good for them.

99. He thought that none of them were under 13, but on inquiring one appeared to be a little over 12. That boy had been in the mill for two years; he read fairly; another aged 13 and 4 months had been there three years; he could only read easy monosyllables, and had to spell out the word "Jesus."

100. Brown paper is made here. The sacking and other material used in the manufacture are all cut up by machinery, consisting of an open wheel fitted with knives, which revolves at the mouth of a small trough-like feeder. One of these Mr. Venables said does the work of nearly 50 women and girls.

101. His opinion was, that "the present Government, having done all that can be done to injure "and ruin the paper-making trade in the United Kingdom by the protection and assistance given to "the foreign manufacturer, any further interference would be unjust and arbitrary in the extreme, "and uncalled for."

Messrs. Ladell and Ibotson, Wraysbury.

167 persons were employed here; 6 boys and 13 girls under 13; 16 boys and 18 girls between 13 and 18; 57 male and 57 female adults.

102. Several of the children did not know their own age; the youngest two were girls between 9 and 10; two girls and one boy were between 10 and 11. One boy of 13 at the cutter could not read the word "sorrow;" he had been working at the mill for 1½ years, and had begun pig minding in the fields at 10 years old. Another boy and three or four girls read tolerably; the girl of 9 better than some two or three years older; she had been at work only for a few weeks, and went to day school before that, but only to Sunday school now. Another girl who did not know her age, but was apparently about 12, read badly; she said she attended night school, but had not been to Sunday school for some months, because she had to stay at home and mind the baby. She could not give me the names of any of the Apostles, nor say who St. Peter and Judas Iscariot were, and what they did, or how Jesus died; all she could tell me was that Jesus was a spirit.

103. *Mr. Ladell* conducted me through the works, and gave me the following information:—

Printing paper for books and millboards are made here, the former by machine, the latter by hand.

In the machine room, which is the only part in which any under 18 work at night, two boys of 12, and 6 lads between 13 and 18, are employed in two gangs on 12-hour shifts night and day in alternate weeks; the change being made by those on the day turn working from 6 a.m. to 12 p.m. on the Saturday and from 12 to 6 a.m. on the following Monday. My own impression of the 24-hour shift is that the men are asleep half the time, in fact they sleep in their employers' time and work in their own. I would never have it here.

The hours for men and boys at other parts of the works are from 6 a.m. to 5 p.m.; those at the millboard rollers sometimes exceed this. At another mill belonging to us lower down the stream the boys at the rollers not frequently make 65 hours in the week; 70 is, as you see from the wage book, an extreme case, they are about 15 or 16 years old. They are not always at the rollers, but also lay the boards out to dry.

The longest hours for women and girls are from 8 a.m. to 4.30 p.m.; in the two rooms where the young ones, the majority of those under 18, work, they are less. One gang who sort refuse paper, work from 8 a.m. to 3 p.m., and the other, who sort paper shavings, the cuttings of bookbinders and stationers, from 8 a.m. to 4 p.m. The latter is cleaner work, the former is very dusty, but there is nothing more than the mere dust, none of the flue of rag cutting.

These girls are paid 6*d.* a day by us. They are placed under the superintendence of forewomen, but do not work in any sense for them. Still we have not interfered much in hiring them; if we had, we should not have had any so young as some of them are.

Half an hour is allowed for breakfast and an hour for dinner. Those who work from 8 a.m. to 3 p.m. have a half hour for dinner; they preferred that to working till 3½ p.m. and having the whole hour. In the machine room, where the work is continuous, the meals are taken without leaving the spot, but the four boys are rarely wanted all at once, except in case of a breakage.

The prohibition of our night work would stop our works and prevent the boys from learning their trade. Legislative interference with our manufacture is likely to do more harm than good.

Paper Mills.

Mr. W.H.Lord.

Middlesex.

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MESSRS. C. IBOTSON and SONS, POYLE MILL, STANWELL, MIDDLESEX.

Out of 108 persons employed here only six were under 18. These were all boys, the two youngest being between 12 and 13. The women were 59 in number.

Millboard and superfine paper for drawing, &c., are made here.

104. *Mr. Ibotson, junior,* who conducted me through the mill, stated that women's hours are from 8 a.m. to 5 p.m., with an hour for dinner. In the machine room men and boys in two relays work from 6 to 6 in 12-hour shifts, with an extra five hours on the Saturday to effect the change of turn. He found both men and boys got very sleepy by 11 p.m. on the Saturday, and doubted much if any advantage was got out of the 24 hour shift.

105. He informed me that boys usually came to work at the mill at between 11 and 12 years old. They would begin at the rolls, where the millboards are glazed, their chief work there being to take out the boards from the rolls, and to lay them to dry either in the loft or in the open air, according to the state of the weather. On looking through the wage book he found that the boy at the rolls often made seven or seven and a quarter days in the week, the day consisting of 12 hours, less one and a half for meals, or ten and a half working hours.* In one recent week a lad 12½ years old had made on the five days respectively, two, four, four, two, and three hours' overtime; that, however, was more than usual. He thought that a law for boys not to make more than six days in the week would not inconvenience them in their business; at the same time he observed that the work was varied, as, for example, the lad would not be employed at the rolls for more than four or five hours out of the ten and a half of the day.

106. Four boys at a time are attached to the machine. When I entered the room with Mr. Ibotson one was laying sheets at the cutter, only one sheet being then cut at a time; a second had been set to occupy his time by cleaning the outside of a copper in the room; a third was doing nothing; and the fourth came in as I was leaving, having been on some errand for the man.

107. The cog wheels at the drying cylinders were shielded; before this had been done a boy had had his thigh broken through being caught in them. His father described the accident to me as having happened in consequence of his foot slipping, as he was leaning over to lead the paper through after a breakage. A man's arm had also been broken under somewhat similar circumstances.

A boy aged 14, who had been three years at the mill, read well. He was then employed in the machine room, but had begun at the rolls.

Surrey.

SURREY.

MR. J. MACMURRAY, WANDSWORTH.

The machine room here is a model specimen. It is large and well proportioned, allowing ample space for passage between and beside the machines, and is kept marvellously clean.

108. We have very few indeed under 18, and no children, except now and then, perhaps, two or three who come for a short time to pick at the beating engines, but they never stop long with us; the fact is they cannot stand the night work. You will rarely find many children employed where, as is the case here, only news and general printing paper is made.

Our paper making machines have each of them a man and a lad, and three girls or young women working at or in connexion with them day and night; the lad helps the man in different ways; two of the girls "catch" the paper at the end of the cutting machine, and the third "finishes." Our cutting machines are all attached to the paper-making machines, and what we call finishing is no more than taking the sheets from the cutter, counting them, and folding them for packing.

Two or three of them of each sex are about 18, and two or three about 15 years old; they work 12 hours at a time; those who are on the night turn have five turns a week, the others have six; and in order to effect the change, they go on from 6 a.m. to 11 p.m. on Saturday, that is 17 hours, and from 12 on Sunday night to 6 a.m. on Monday; then those who had the night turn in the week before come in for the day turn from 6 a.m. to 6 p.m.

They have no fixed time for their meals, they bring them and eat them here; not all exactly at their work, for the finishing girl comes and takes the place of one of the catchers while she gets her food. The catchers generally have 8*s.* a week; that youngest has 7*s.*; some women get 15*s.*

We have one or two adult women also, who wash and clean the place, and six girls or young women from 17 years old, who help at the bleaching engines, most of the women, however, are cutting or sorting rag. The hours of the rag cutters are from 7 a.m. to 6 p.m., with an hour for dinner. They are all over 18; little girls of 13 or 14 could not reach our tables, and would cut themselves to pieces, besides doing bad work.

There is a ventilator on Watson's principle of the up-and-down draught all along that part of the roof of the machine room that is over one machine and its cylinders; but with every contrivance the room is always hot; 90° is about the average heat; in hot weather the thermometer stands at 100°; to-day (August 27th, autumnal, H. W. L.) it is 91°; to prevent the steam from condensing, the roof must be kept very dry, so we are obliged to have a high temperature.

I must say for my own part that I very much dislike and disapprove of this night work. It is not that the physical effects are bad—at all events our people are all wonderfully healthy while they are working for us; but I think the moral effect is by no means good. So far indeed as the working of the two sexes in the same room at night, we have been very fortunate; but from a social and even a sanitary point of view, it operates badly, and this more upon the families of the men, than on the men themselves. It frequently happens that all or most of the members of a family work for us; some being on in the day and some in the night; the consequence is that one is no sooner out of bed then another gets into it; that is most unwholesome. Then again the girls here often marry the young men whom we employ, and remain in our employment; they have no time for domestic duties, so that their dwellings are rarely cleaned, and if not overcrowded by their own families, they make them so by taking lodgers; of course, other people than paper makers have dirty and overcrowded dwellings, but these are in a special way, as it were, tempted and almost forced to do so. I notice the bad effects in the pale sickly faces of the children, who bring the food here sometimes for their parents or elder brothers or sisters.

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* A day on Saturday is reckoned as 11 hours, with the same deduction for meals as on other days.

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Besides this, the men themselves have no time for education and self-improvement, while for the younger ones it is far worse, they have not even time for play, which they want as much as learning, or they take it out of the time for eating and sleeping, but they ought to have time for all these. Here is one instance: that young woman, who is "catching" there, cannot read!

The fact is, people ought to be made to have the day for work, and the night for rest. My own conviction is—though I believe that very few employers in our trade agree with me,—that if a general act were passed to prohibit night work altogether, for male adults as well as for women and children, it would be a benefit to the trade; the quantity produced would be lessened, and then prices would rise, or more capital would be invested and plant laid down. Foreign competition no doubt then enters into the question, so far as certain classes of paper are concerned; but I think that is more used as an argument than feared as a danger.

No doubt, also, there is loss from stopping, or rather from starting afresh; waste both of fuel and of material. After we shut down on Saturday, everything gets cold by Monday morning; we do not work out the contents of our troughs, but leave them, as they happen to be, till the Monday. There is the extra consumption of fuel, before the whole gets in working order; the contraction and expansion of the cylinders, boilers, and other parts of the machinery, which actually injure the latter, and, in the first-mentioned case, by altering the speed of revolution, cause the greatest trouble; thus the consequent waste of pulp, and the amount of bad paper always made at starting, are astonishing. I assure you, our trouble every Monday morning is nearly enough to drive one cracked, and if I were not here from the very first at midnight, and constantly looking after this one or that one, till we are fairly started, I think we should never get off at all. However, in 12 hours they would not get so cold, as they do in 24 from Saturday night to Sunday night. Some time ago we had to shut down for eight hours at a time repeatedly for several weeks, and never had any difficulty in starting after that interval.

With regard to health, I am often surprised at our men; some who have been 14 and 15 years here have not been absent for a day from illness or holidays. But I am very strict; no beer is allowed here on any pretence, and no irregular person stays with us. At the same time I am not so sure that we are right in inferring that the night work does not hurt them, because they are apparently strong and hearty now. It is all very well so long as they are young; we don't notice how it happens with them as they get old. It is more than probable that there comes a time, all of a sudden, when they go down like a shot, because they have been living unnatural artificial lives, and have no real strength to resist disease or decay.

With regard to stoppages, I should tell you we are not a fair sample, for we do not even change sorts on an average more than once in 24 hours; in many mills even the felts, &c., would be changed every day; we constantly have very large orders, and our power is such that 200 reams can be made here by one machine in 12 hours; that is 200 times 516 sheets. Suppose an order for 800 reams, we could do it in 24 hours with two machines, and should not have to change anything.

I have said that night work should be stopped for all; indeed, if men were allowed to work through the night while women and young persons might not, a great injury and injustice would be done to persons who, like ourselves, have our cutting machines attached to our paper machines; for we should be obliged to work our men through the night to keep up with others in the trade who would still do so; but we should also have to employ men at the cutting machines, whose fingers are not nearly so fit for the work as women's, and whose wages are much higher; while others, who have their cutting machines separate, could reel off all they made in the night, and have it cut by the women as usual in the day, without interfering with what they make in the day time, as all the paper made by one machine in 24 hours can be cut by a separate machine in 12.

109. *Lad at machine.*—I am 18; began work in the fields at 9; came to a paper mill at 12; used to help the men first, to carry things for them; before long had to pick out blacks at the beating engine; that tries the eyes, it dazzles so; but it hasn't hurt mine. Used to work 12 hours on and 12 off then as I do now; always like the day work best. Watch the paper through the cylinders now; shouldn't like at all to do it for 24 hours at a stretch; get quite tired enough after 12. Those women never come anywhere near the straps which come through the floor, nor the cog wheels or gearing.

110. *Mrs.* ——— (a young married woman).—Sometimes there are four girls at the cutting machine, sometimes three, as now, but most commonly two; it depends on the size of the sheets into which the paper has to be cut. Some are always here; the extra ones come as they are wanted. Their work is light enough; each of them has two half hours for meals in the 12 hours of their work, and two rests of 20 minutes besides. During that time one of us two takes the place of the absent one at the machine That is an agreeable change for us also, for our counting and folding is all standing work, and more tiring than theirs, for they sit always.

I should not like at all having to do this for 24 hours, even though I rested or did what I liked for the next 24; indeed I could not. The 17 hours' turn on the Saturday makes us all very tired, but as that comes only once in a fortnight, it does us no harm. There is a third half hour for tea at about 6 p.m. there. We all prefer day work to night work I think; I know I do myself.

[111. The three girls at the cutting machine, and the other finisher, gave me very similar information. The youngest of them told me that she was 13 years and 6 months old, and was the youngest in the room; she had been at work there only a few weeks.

112. Another stated that when they were on the night turns, they had their breakfast as soon as they reached home, at about half-past 6 a.m., and then went to bed until 3 or 4 p.m., when they got up and had their dinner, so as to get to the mill again by 6 p.m.

113. A third said that the room was very warm in summer, but that it was kept beautifully clean, the boards being washed twice a day. All agreed in preferring the day to the night work, and in thinking, from their experience of 17 hours' work once in a fortnight, that they could never stand 24 hours of work, and should not like it, even though they would have the following 24 entirely at their own disposal.

114. Upon this subject the machine man observed that in the country, where the system of 24-hour journeys was very general, the men all liked it, because they often did nothing for seven or eight hours out of it, and could work in their garden or do as they pleased on the alternate days, but that at Wandsworth every one worked hard all the time they were there.—H.W.L.]

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Mr. H. W. Lord.

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MESSRS. PEWTRESS & CO., EASHING, GODALMING.

93 persons are employed here; 38 are females. The youngest is a boy aged 12 years 11 months. Another boy is between 13 and 18 years old. The rest are all adults.

115 *Mr. Elwyn*, clerk.—We make paper for newspapers, and have both steam and water power, but chiefly use the former. Out of the 93 now employed here, two sets, of 12 persons in each, work in journeys of 24 hours. All the 24 are adults; six are females. The latter are at the cutting machines; three to each machine. We have three, although only two can work together at a time, in order that they may relieve one another, for it is often hard work to draw our large heavy sheets off from the revolving felt, which delivers them from the cutter, as they frequently stick to it. The two sit at the end of the machine opposite one another; each takes an hour at each side, and then is off for an hour, during which they prepare and take their food, and those who have husbands or sons here, prepare their meals for them also.

On Saturday the journey hands work from 6 a.m. to 11½ p.m., and the fires are lit again at 9 p.m. on Sunday night, but the work does not begin till 12. The set that worked the 24 hours on Friday come then, and work only till 6 a.m., when the other set come on for their 24 hours.

There certainly may be, and have been, moral evils connected with the night-work, but very much depends on the general management. We endeavour to have steady married women and respectable men, and consequently avoid any harm. But when young people of both sexes work through the night together, it is a bad thing, and is well known to have bad results.

Those, however, who work the 24 hours, all say they prefer it, especially those whose homes are at a distance, and some of ours live three and four miles away; indeed, we tried working in journeys of 12 hours for some months three or four years ago, but the men did not like it at all, and asked to return to the old system. It is nothing more than the force of habit. The mill has been here for 30 years, and they have grown up with the system.

I have been here ten years. In that time there has been no very serious accident; but we have been remarkably fortunate. We have not lately had even trifling ones. A year or two ago several of the lads, one after the other, had their fingers nipped between the cylinders; they lost their nails and so on, but not the joints in any case. One of our men lost his arm some years back; that was in saving a woman whose dress was caught between two cog-wheels. We have had a guard put there since.

116. *Mr. Sanderson* (foreman.)—Besides the loss of the 12 night hours there would be a great loss of fuel, if we had to work only from 6 a.m. to 6 p.m. We think our fires are lit very quickly on Sunday night, if they are ready in two hours. No doubt there will always be also a loss in waste of pulp and paper at recommencing, but so far as that goes, stoppages are matters of daily occurrence in every paper mill, to clean and repair the felts, belts, and wires, &c. takes on an average two or three hours in every 24; this is part of the work of those who are in charge of the machine; the felts, &c. are changed about once in 24 hours; that takes nearly two hours; the females generally rest, while the machinery is still.

The rag cutters, whose hours are from 8.30 a.m. to 5.30 p.m., have an hour and a half for meals; their earnings average 6*s.* a week.

We pay the women at the cutting machine 8*s.* a week; when I first came I told Mr. Pewtress that girls under 18 might be had to do the work for 8*d.* and 9*d.* a day, as they did at other places that I had been at; but he would not introduce younger ones for the sake of saving a little. Still if we wanted a woman at the cutting machine, and a strong girl of 16 offered, we should probably not refuse to take her on; indeed, we had one of about 15 or 16 two or three years ago.

There would be a difficulty, if women were not allowed to work at night at the cutting machine, for it is not man's work, and at all events a good deal more would have to be paid.

Several bad accidents have occurred at other mills at which I have been; some through the bursting of boilers or of beating engines; at one a man's arm was caught between the glazing roller at the top and the large cylinder as he was trying to tear a crack off; that is not an uncommon source of accidents. Any loose garment too is dangerous. I was in a paper mill in Russia, where the men wore their shirts or blouses outside with a belt, and they were constantly in danger of being caught in the cog wheel, till I made them tuck them in.

117. *W. Smith* (engineer at beating engine.)—I have been at this work for eight years; in that time I have been twice absent from work through illness, for about five days each time. We were then on a low sort of rag, which we bleach in the same engine that the rag is beaten in; the "souring," which is put in to bleach, sets the gas free, and that gets on the chest, and makes you cough and retch; I had to go to the doctor, and to take pills. The bleaching is mostly done away from the engine, and then there is no harm. My health is very good.

118. — *Bonner* (rag foreman.)—I myself would sooner be among all this dust than at the beating engines. I tried them once, but I gave that up in six weeks, for I could never eat my food, and the "souring" made me get puffed, and blew me up like a toad; it was not the 24 hours' work that hurt me, for after that I went to stoking, and that did very well for me. It is all a matter of constitution; no one with a delicate chest should be a rag cutter; but most of them get on well enough after they are used to it, with the help of a little opening medicine now and then; they do sometimes cough it up.

I have been in other mills in this district; children are not much employed in them. I was, however, at one two years ago, where there were 34 females; 19 of them were sorting and picking waste paper, and out of them nine were under 13, but the youngest was nearly 11. That was not regular work; it lasted about two months, and then these children went off home or to school, for we did not do any more of that. If we had had another lot of it, we could have sent for the children again, and have had them at any time.

119. *A rag cutter* who had been for 19 years at the work told me that her chest always hurt her; but she had been in service before that, and had then suffered in the same way. The dust always affected her more in the winter, when she would be more liable to catch cold. She thought that the action of cutting was rather good, as it tended to open the chest, and that rag cutting was at all events more healthy than dress-making, at which she had sat all day long when she was younger; at the same time, women who worked in the fields were no doubt more healthy than rag cutters.

120. I afterwards spoke to the man to whom the accident had happened, and was shown the place where it occurred. There were two machines placed side by side in the room, with space enough for a man or woman with garments of ordinary size to pass between the two with safety. But the woman in this

Paper Mills.
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case had left her usual place at the end of the machine, and was standing with her back to the machine in motion, half way up the room, receiving instructions from the machine man as to the darning of the felt of the other machine, which was at rest. Immediately behind her were the cog-wheels of the machine in motion. These, through some movement on her part, caught her skirt, and in trying to drag that away the man's arm was drawn in and crushed, before the machine could be stopped. The woman escaped uninjured.

121. I was informed that the machine was commonly oiled while in motion, always by a man. Wooden galleries were placed at different parts, which enabled him to pass to do this in safety.

122. It was stated to be a matter of general experience that if the top of the machine room was cold, the steam condensed and dropped upon the paper; it was therefore necessary to maintain considerable heat at all times in that building. This was said to be more trying to the older than the younger women. H.W.L.

MESSRS. SPICER, BROTHERS, ALTON, HANTS.

104 persons are employed here. 47 are females. Five boys are under 13; 12 boys and 10 girls between 13 and 18. The youngest boy is between 10 and 11 years old.

Writing and account-book paper is here made by hand; steam power, and occasionally water power, being used for the beating engines and glazing rolls.

Mr. Henry Spicer, and his nephew, *Mr. J. H. Spicer*, who resides at the mill, conducted me over the premises. The following statement, drawn up by me, has received their approval.

123. Steam power had for the last year been used to move the hydraulic presses, since it was found that the boys, who used to work the hand wheel, complained of the fatigue of doing so. This was commonly the duty of the "layer," who frequently was a lad of from 15 to 17 years of age. Trucks, which run upon rails, are used here to carry the "posts" from the vat to the press. Thin paper is very seldom made at this mill, and the vat's crew rarely work longer than from 5 to 5, and more frequently less. The youngest apprentice was 15, and had been a year there.

124. The women in the "sol" usually work from 8 a.m. to 5 p.m.; sometimes they begin at 7 a.m. The youngest in this room, a girl of 15, said she had been there a year. In the rag-cutting room the hours are from 7½ a.m. to 5½ p.m. The youngest here, a girl who said she was 13, but did not know her birthday, could read a little; another aged 14 could not "read Testament." Both these girls had been a year at work.

125. In the glazing room about 12 boys are employed from about 11 to 15 years of age. They work in sets of three, one taking the glazed sheets, as another lifts the plates off the wad, and places them one by one on the unglazed sheets, which the third supplies. The usual hours here are from 6 a.m. to 7 p.m. with about three-quarters of an hour for breakfast, an hour for dinner, and half an hour for tea. Mr. Spicer, junior, stated that he had no means of arriving at the amount of overtime made by each individual in the glazing room, but that his books shewed that in the aggregate the overtime would average seven hours a week, or from 5 a.m. to 7 p.m. Occasionally work goes on through the night; in that case a double shift of boys is always employed. Sometimes when working overtime, girls from the rag room come, after their own work is over, to relieve the boys in the glazing room. There is no scarcity of boys.

126. The "folders" who lay the plates on receive 10*d.* a day; the "putters in" and "takers out" 8*d.* Last winter they used to "shut off" early at 6½ p.m. to enable them to go to night school. During the hopping season, which lasts for three weeks or a month, very many of the hands leave the mill, and return after that is over.

127. Mr. J. H. Spicer thought that the rag cutters were very healthy now that they had a new and large room; but it was not an uncommon thing for them to faint in the summer, when they used to work in the old room, which was small and close.

128. *Jane Pearman.*—Am 16. Have been four years here. Was for the first two years in the glazing room and picking the paper, and have been two years in this sizing room. I stand at this end, and put the sheets three at a time on the felt, which takes them through the size, and another girl at the other end takes them out. It is very hot here; the heat makes me ill sometimes. I stayed away for a day last week because of it. I have been off work for a week at a time; it gives me a sick headache.

[129. *The man* who looked after the size told me that the last witness seemed to suffer from the heat more than the others who had worked there. The hours were 12 in the day for five days only in the week, Saturday being occupied in washing up. Work goes on, while they have their meals, but the girls are then relieved by others who take their place for a time long enough for them to eat their dinner. A thermometer placed within a short distance of the part where the girl stood rose to 79°. The man stated that in summer it was much hotter.]

130. —*Aiston*, (boy in glazing room).—Shall be 12 next March. Have been here a year. Come to work at 5 a.m. on most days, at 6 a.m. on Mondays. Leave at 7 p.m., and sometimes 8 p.m.; on Saturdays at 3½ p.m.

[This boy answered several Bible questions fairly, and read most words of one syllable correctly, but he could not read "cross" or "sacred," even after spelling them. At first he stated in answer to me that he came to work at 4 a.m., but afterwards I found that he meant that he got up then.

131. Another boy aged 11 next Christmas, who had been at work since May, gave me a similar account of his hours of work.]

132. *Levi Mason.*—Am 13 next Christmas. Have been here a year. Went to day school for near a year before that. Go to Sunday school now. Don't read there. Am read to by teacher.

[I tried this boy with a hymn beginning, "Jesus lives;" he had to spell out even

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the first word letter by letter. He could not tell me the name of any Apostle or other person mentioned in the Bible, and on my trying to help him, did not know anything about "two brothers being called by Jesus " to follow him, as they mended their " nets by the seaside." His father was a paper-maker, earning 45*s.* a week. He and his next brother earned 10*s.* together, an older one 14*s.*, and his mother 6*s.*, all living together and employed in the same mill!

133. One of 16, who had been at the mill for two years and a half, and was at a printer's before, read tolerably well; he, however, stumbled at the word "enmity," and did not know its meaning. Another, aged 11½, read fairly; he had begun work as an errand boy at 9 years old.]

HERTS.

Herts.

Messrs. J. Dickinson and Co.

1. Nash Mill.

[In September 1864 the lads under 18 years of age employed at Nash mill were 18 in number, only three being under 13; the youngest was aged 11 years and 2 months.]

134. *Mr. John Evans.*—I am managing partner in the firm of Messrs. Dickinson and Co., paper manufacturers. We have a number of mills all along the stream from Two Waters to Rickmansworth; the one, which you have seen already (*inf.* 3) supplies four others with the "half-stuff" or fibre to be made into pulp for paper. At this and our other mills where the paper is made, the manufacture is continuous from 12 on Sunday night with water power, and from 6 a.m. on Monday with steam power day and night until Saturday night. I believe it is true that some boys have been met coming from our mills early on Sunday morning; that, however, would be an extremely rare occurrence. They work in journeys 24 hours on and 24 off. The boys who work in that way are chiefly employed in picking any foreign matter out of the half stuff, as it is being ground to pulp in the rag engines; they take it in turns to lie down during the night, and after a certain time the picking ceases, that is to say, the time comes, when the pulp in the engine has been completely picked, but still requires further grinding; then the boy has nothing to do.

Our rule is to take none under 10½ years of age, and from that up to 13 and 14. We have schools, and compel one group of boys each day to attend them. We probably employ more than the usual proportion of boys, taking all our mills together; for at one there are 150 or so folding envelopes; theirs is only day-work, 6 to 6, with two hours for meal times, and they eave at 2 p.m. on Saturday. Boys can earn from 3*s.* to 7*s.* and 8*s.* a week with us.

We also employ boys at the cutting machines to "catch" the paper; but as those machines are separate from the machine that makes the paper, they do not work day and night. The paper as it is made is "reeled" off, and taken to another machine to be cut. A cutting machine can cut in the day as much as is reeled off in a day and night. We do not scrape our strainers, as the paper is being made, and therefore do not employ boys for that purpose.

We have had serious accidents, but not from cog-wheels catching parts of dress. A short time ago one of our lads was killed in trying to put on a strap to set some machinery going. It was no part of his work: indeed, he had no business to be in the place at all. It is not known how it happened, for it was just after breakfast, and no one was there.

I do not think that any system like that of the factory half-timers working by relays could answer in a sparse country population. We try as far as we can to make a certain proficiency in the elements of education a preliminary to employment; some general scheme of that kind might be made to work.

135. *Mr. Peacock* (foreman).—The boys at our cutting machines very rarely exceed their ordinary hours, six to six; they certainly do not make two hours overtime in a week, taking the whole year round, and that would not happen continuously night after night for a fortnight or a month, but only for a night or two now and then. We have as many cutting machines as we have paper-making machines, and can cut two sheets at once (that is to say, can have the paper of two reels passed under the knives of our machine at the same time); of some kinds of paper we can cut more than two at once.

The hours of the women in the "sol" who sort the paper are from 9 a.m. to 5 p.m. with an hour for dinner; they are on piecework, and never stay for more than an hour beyond their usual time; only one of them is under 18.

Our stoppages in the ordinary course for cleaning felts and wires, changing sorts, &c., are usually arranged so as to take place at breakfast time; I should say that our machines are shut down every morning from 8.30 to 11, or thereabouts.

136. *Samuel Lendon.*—Am 13; have been here four months; I pick at the engines; begin work at 6 a.m. and go on till 6 the next morning; at 10 p.m. I always lay down and go to sleep till 2 a.m.; when I am asleep, that other boy is on.

137. *Henry Lane.*—Am 11 years 10 months old; began here last July 12 months; I go on till 2 a.m. to-morrow morning; then I shall lay down from 2 to 6. I shall get half an hour's sleep before that, at about 11 p.m. to night. I came on at 6 this morning.

> [Both these boys and one or two others whom I asked had been to school and could read. H.W.L.]

2. Home Park Mill, King's Langley.

138. About 16 boys of ages varying from 10 to 12 were employed in picking paper shavings. Several of these could not read; they seemed to be inferior both in education, demeanour, and in physique to others not much older than themselves, who were employed in the glazing room, at the cutting machine, and as helpers about the place. Mr. Evans attributed this simply to the fact that the latter had been regularly employed for a longer time on the premises, while the former had been taken more recently from the fields.

139. *The foreman* here stated as his excuse for having taken on some, whom I noticed as looking too young and unfit for work, that at this time of the year (Sept.), so many preferred field work, that he could not get older ones.

140. Several women were employed here in laying colour on in a liquid state to sheets of paper by means of brushes, a process similar to the "grounding" of paper stainers (First Report, App. p. 119); one or two of them were 16 or 17 years of age. The coloured paper was afterwards glazed by the ordinary process.

141. It was not found necessary for those, who worked by day only, to exceed the usual 12 hours of work; at the "engines" and paper-making machines the system of 24-hour journeys prevailed in this, as in the other mills of the district.

3. Batchford Mill, Rickmansworth.

187 persons are employed here; 145 are females; 2 girls are between 12 and 13; 6 boys and 16 girls between 13 and 18 years old.—January 1, 1863.

142. *Mr. Tolley* (manager.)—All that is done at this mill is the cutting and sorting the rag, which is what the women do, and reducing it to the state of fibre, which we call "half stuff," preparatory to other processes, which it undergoes at other mills along the stream belonging to the same firm.

We have now 187 persons employed here; sometimes we have many more; the youngest are two girls, who are between 12 and 13 years old; as a rule we seldom have any here under 14 years old.

The females work from 8 a.m. till 5 p.m.; the mill goes on day and night, and the men work in sets, three in each set, from 6 a.m. to 6 p.m., or from 6 p.m. to 6 a.m.; the lads do not work through the night; they sometimes stay as late as 8 p.m., but never later; they feed the sifters which cleanse the half stuff.

The women are now leaving off at 4 p.m.; and some come or not, just as they please, for nearly all, of both sexes, are on piece work. We begin to pay on Saturday at 4 p.m.; sorters have about 8*s.* and dusters 9*s.* a week; some of the lads at the machine have 10*s.* Half an hour is allowed for breakfast at 8 a.m., an hour for dinner at 12, and half an hour at 5.30 p.m. for tea.

I believe that the rag cutting and sorting, or rather the dusting, does not do any harm to persons of an average state of health; it does not suit unhealthy ones.

It might, and probably would, work well to insist on a certain amount of education as a preliminary on the employment of young persons; but we have too few under 13 to work on a half-time system.

4. Apsley Mill.

143. Nearly 250 lads from the age of 11 upwards are employed here; some in the manufacture of paper, but the majority in making envelopes. I examined more than a dozen boys between the ages of 12 and 17: most of them could read without much difficulty a verse of a hymn, which consisted of words of one syllable, and could answer simple questions of Bible history. None had learned any geography, and few any cyphering beyond addition and the multiplication table. The words "enmity," "continue," "atoning," were read correctly by three or four only. The words "image," "inspired," "coward," "captive," by six or seven.

144. By a rule of the establishment, all the younger ones were compelled to attend Sunday school, and books of such attendance were kept by the respective masters, and regularly forwarded to the resident foreman. Any boy who had not been to Sunday school had to go to the day school at Nash Mill for the greater part of some one day in the following week.

145. Several of them attended an evening school which was held on three or four nights in the week during the winter months. A very intelligent lad, aged 17, whose name I omitted to ask, a layer at the cutting machine, told me that he had worked in the mill for seven years, and had got all his learning from evening school.

146. *The foreman* stated to me that he had for some years been strict about admitting none before they were at the least 10½ years old, but still some who were younger now and then obtained admission by the misrepresentation of their parents.

147. *Frederick Rolfe.*—Am 12; have been here 8 months; used to cut straw for straw plaiting before that; began that at seven years old. Have never been to any school but Sunday school since that; know something about Daniel and lions; not about Elijah.

148. *H. Atkins.*—Am 12; have been here for two years; went to a day school for about two months; don't know who Judas Iscariot was; Jesus Christ is everybody.

[Reads badly.]

149. *Thomas Sear.*—Shall be 12 in the month before Christmas; don't know what month that is, nor what month Christmas is in; can't tell you the first month of the year, nor what month this is. Have been here three parts of a year; have not been to any day school for four years: worked in the fields before I came here.

Reads letter by letter.

150. — *Beckett.*—Am 16; have been 7 years here; began at picking half stuff; was at that for a twelvemonth; then all us young ones were sent away, because we did'nt do it well enough. Went to the rolling room at about 10½ or 11; am now in the envelope room. Tried picking at the engine for one night, but did'nt like the 24 hours work at all, not the night part of it, so had no more of that. Am no scholar; can read only a very little.

151. *Joseph Smith.*—Am 15; have been in the engine house for three years; was at envelope folding for two years before that. Like the 24 hours turn, which I have now, much better than the 12 which I used to have in the day time, because I get a whole day to myself three times a week; should still like it best, even if I could earn as much at one as the other. I don't get sleepy; I come on at 7 a.m., and don't sleep till 2 a.m.; then I sleep till 6 a.m. The other boy with me lies down and sleeps from 10 p.m. to 2 a.m.

Messrs. G. W. Hayes and Co., Two Waters Mills, Hemel Hempstead.

91 persons are employed here; 59 are females; none of either sex are under 13; 18 girls are under 18.

152. *Mr. Hayes.*—We make nothing but superfine paper for printing, not writing paper nor news. Females are employed by us only as rag cutters and sorters, or paper sorters; we have lads at the cutting machine, but they are over 18 years old.

The hours of the women are from 9 a.m. to 5 p.m., with an hour for dinner; they work perhaps a dozen times in the summer until 7 p.m.; but they have only once been later than that; they worked until 8 p.m. for one week in July last. I do not like their working, as a rule, longer than seven hours a-day among the rags; for though we use a dusting machine, which gets rid of the worst portion of the dust before the rags come to the women at all, it is not altogether a

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wholesome occupation, at all events not for any whose chests are weak.

Many of them make straw-plait at home after our work for the day is over; there is a straw-plait market here once a week; and straw-plait schools for quite little children; these have a bad effect, for they prevent the young ones from receiving any proper education; we have ourselves paid the fees for children to attend the national schools, and have found that they did not go; their parents preferring that they should earn a few pence at plaiting.

Our men, who are all over 18, work in journeys of 24 hours; it is the custom of the trade in this district, and they all prefer it to any other. For my own part I should be rejoiced if night work could be wholly done away with; not on account of the men, for their health is very good; and where only men work there is no objection on moral grounds, but simply because of the immense anxiety it occasions to the employers; I have myself to be constantly on the watch, staying up till 1 or 2 a.m., or getting up at 3 or 4 a.m. for fear of accidents or damage. I must admit that we have never had any accident at night, and we have had some in the day; but still I think night work dangerous and scarcely profitable.

Upon their health the 24 hours' work appears to have no appreciable effect; we have one man over 60 years old who had always worked in that way, and several others have been a long time at it. A great portion of the time is spent in resting and watching. The lad at the cutting machine, for example, lies down and sleeps for two or three hours in the night, while several rolls are being reeled off, for our cutting machine, though in the same room as the paper making machine, is separate from it.

I am very careful to have all cog wheels boarded off, and the gearing placed where there is no passage; I never allow aprons or loose blouses and such things to be worn.

Our stoppages do not amount to much; about once in every 24 hours the deckles are shifted to change sorts, that is, to alter the size of the paper; half an hour is taken up with that; we wash the felts only twice a week, and that occupies about 20 minutes. We clean our wires, perhaps twice in a month, by applying fire to them. The "souring," which is put by some into the bleaching engines, consists of vitriol and water. We think it best to apply it to the half stuff after bleaching, if it must be used at all. The effect of putting it into the bleaching engine is to disengage the chlorine gas.

After the rags have been cut and sorted, they are boiled and then washed and ground in the rag engine; then they are bleached; after that steeped for 24 hours, and dried. They are then transferred to the beating engine and thence pass to the machine in pulp.

153. *Mr. Johnson* (foreman.)—I think that the 24-hours' journey has advantages over 12-hour shifts; a man who has worked the night shift is too apt to drop in at the public-house as he goes home in the morning, and to stop there long enough to make him unfit for his work at night again; but if he is off for 24 hours, at all events he has time to go to bed, and be fit for work the next morning.

There is nothing at all injurious to health in bleaching with the powder, as we do; that is now in general use; but gas bleaching is killing work indeed.

154. — *Mutton.*—I have been among bleaching engines for 45 years; the powder we use in the poaching engine is rather good for the health; the gas bleaching is very different; I was at that for three years and it nearly made an end of me; I used to spit blood; if it catches you, when you open a chest, it throws you right down in a kind of faint; you get blown out like a barrel; the only thing is, when you have to open a chest, to pull the board down and run off as hard as you can. Gas bleaching is not so common as it was, but I know of places hereabouts, where they use it still.

I have always worked the 24-hours' journey, and should not like to change to 12 hours night and day shifts. It never hurt my health, nor anyone else, so far as I know. When I get home at 6 a.m. I have my breakfast and then go to bed till 2 or perhaps 4 p.m., then I have my dinner and work in the garden and go to bed again at 9 or 10 p.m. till about 5 a.m.

[155. Several men agreed with the last witness as to their preference for the 24 hours, one saying that if he had boys of his own, 15 or 16 years old, he would choose the 24 hours for them, rather than the 12 hour-shifts in alternate weeks. H.W.L.]

156. *A workman in the paper-sorting room.*—The heat in many paper-making rooms is bad for young lads. I had to take a boy of mine away from a mill near here, where he was at the cutting machine. He was 15 years old. His appetite was constantly failing. He sometimes worked there as long as from 4 a.m. to 8 p.m., but it was the heat more than the hours of work that hurt him. He is at other work, and is quite well now.

Mr. G. Austin, Solesbridge Mill, Rickmansworth.

157. Most of the paper mills are now worked by steam, but mine here is all water power. In this district chiefly make newspapers. I think there is not much overtime. 8 a.m. to 5 p.m. are the usual hours, not only in my works, but hereabouts, for the women and girls, the rag sorters that is.

Those that make the paper, work 11 or 12 hours a day; that includes the dinner hour, for they take their meals at the machine. I do not drive my machine on an average more than 12 hours a day. In my mill there are only two boys under 13. They lay sheets. The youngest is 12 years old. He has been a year with me. He can read and write. My hands have all been to school, and most of them go to night school twice a week now. Children under 12 are scarcely ever employed in paper mills in this district. The women go wrong in other places I understand, sometimes, but mine are all respectable. Several have gone from my place into service, and have kept their situations. As I require but few I discharge the unsteady ones. I don't think the women ever work at night in these parts; if any do, it will be one or two helping the men at the machines. The night work in this neighbourhood is always done in shifts, each shift working 12 hours, from 6 to 6. That is where steam power is used.

The only difficulty of adopting the factory relay system for those under 13 is the distance of any school. The nearest day school to these works is three miles off.

They earn about 4*s.* a week on the average. I dare say they would come for half that rather than earn nothing, but it is doubtful.

We use, as a rule, only the house rags of the neighbourhood. In the last five years we have had one case of small pox, which some attributed to the rags; they were foreign.

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158. At one large mill in the Eastern Counties I received, on my arrival, the following note:—

"The proprietors of these works decline to comply with the request of the circular, which they consider unnecessary. The work people are well cared for, and the employment healthy."

Notwithstanding this, the son of the principal partner and the foreman conducted me over the whole of the works, and answered in the fullest way, for my private information, all questions put by me.

I regret that the circumstances under which I received their answers, and viewed the premises, preclude me from giving any further account of them; more particularly, seeing that not only did the hours of work appear to be moderate, and (except so far as the night work in alternate weeks may affect the machine and cutter boys) unobjectionable, but also the sanitary arrangements in these mills were in several respects very superior to most which I have seen.—H.W.L.

Lancashire.

LANCASHIRE.

April—July, 1863.

Messrs. James Wrigley and Sons, Bridge Hall Mills, Bury.

470 persons are employed here, more than half of whom are females. 15 girls and 9 boys are under 13, only two of them, one of each sex, are under 10; of those between 13 and 18 years old, 31 are males and 60 females, the adults are 168 females to 192 males.

The premises are of modern construction, spacious and well built; some of the paper-machine rooms were very warm; in one case the very height of the room seemed, by condensing the steam at the top, instead of suffering it to escape, to be less adapted than one of a lower pitch might be, to secure adequate ventilation. In the dusting and chopping rooms the dust was considerable, although most of the machines had fans, and were boxed in.

159. *Thos. Wrigley.*—The usual hours for women and most of the girls are from 6 a.m. to 6 p.m., with two hours for meals; they are often later than 6 p.m.: in the department where the clean sheets are sorted, and the older girls and women engaged, there could be no harm in their working occasionally till 8 p.m.; but where there is much dust that should not be.

Some of the younger girls are employed in sorting cotton waste from the mills: sorting generally, and all the preliminary work, such as cleaning, chopping, and dusting, is done by female labour; some kinds are much worse than others. Rag sorting, and the dusting, where the machines they call "devils" are working, are much more disagreeable than waste sorting, and still more so than the African grass is. A girl of 13 earns at waste sorting 4*s.* and 5*s.* a week; the rag waste sorters get 9*s.* and 10*s.* Theirs is all piece work, they very seldom stay later than 7 p.m.

Women who sort the paper in the sheets after it is made, stay not unfrequently till 8 p.m., and the "catching up" girl at the end of the machine may stay late sometimes; but we make a boy stay to catch up if we can, and send the girl away at 6, if it is known that the machine will work late.

Of the boys, some are bagging up the waste, others are "picker-scrapers" to the paper machine. Some over 14 are "back-tenters," they get 1*s.* 6*d.* and 2*s.* a day; the catchers get 8*d.* or 1*s.* a day.

As a rule we do not work through the night; some of the washing is done then, and the rag engines have to work later to supply pulp enough for the paper machines by day. In most other mills the grinding and making goes on night and day. Our beating engines work generally till 8 p.m., and sometimes later. The machine will on an average make paper in 10 hours of what the engine has taken 15 to grind.

If anything happens to delay the paper machine, such as a strap breaking or the like, those at that machine have to work later to make it up. This is necessary. Otherwise the man at the beating engine, which is continually supplying pulp to the reservoir of the paper machine "gets on the top of the other," as they say. The contents of that chest have to be worked down to about 18 inches of the bottom before the paper machine can stop; so if they break down for two or three hours in the day, they may have to go on till 8 or 9 at night.

The time they take also varies with the thickness of the paper to be made, for of course a thicker paper takes more pulp in the same time, and therefore empties the chest sooner.

On the other hand, the engine which supplies pulp for the paper machine must work up to 8 or 9 p.m., and sometimes later, or otherwise the repository would be empty when they wanted to begin to make paper in the morning.

They don't stop for meals in the machine room, but get paid overtime for the meal times, so that they have their 10 hours and two hours overtime every day. They have however opportunities of getting fresh air, going down the yard, and so on; and during their time for having their food are probably out of the room for the greater part of two hours; for so long as there is some competent person to mind the machine, we do not object to their being absent for a while. The others all stop for meals, the rag sorters, &c.; dinner is from 12 to 1. They have a kitchen of their own, and a room above to eat their meals in. I find the rooms and appurtenances, gas and coal; they pay the cooks,—there are two,—and provide their own food.

We could not manage so as to stop the machines for meal times; it would take at least half an hour to get the cylinders hot again, if we stopped in the machine room. Besides the delay and loss of time, there is a positive loss in waste of pulp and broken paper. Whenever, from any cause, as it is, a paper machine has to be stopped, all the pulp must be washed off the wire, and the wet sheet scraped off the roller, and the sheet upon the cylinders breaks; then in starting afresh the pulp has to be led by the hand on to the wet felt, and thence again to the dry felt and through the presses. Again, one uniform heat can be easily maintained, but is difficult to be got at once: if the cylinder is too hot, the paper snaps; if too cold, it is damp. We have 11 paper machines, and each machine has from six to eight cylinders; in other places each may have 10 or 12, and more; all the cylinders must be at exactly the same temperature before a perfect sheet can be made. At least a quarter of an hour is lost, and a corresponding quantity of paper spoiled every morning by each machine before they make a fair start. Even in the mere gathering up after a breakage, while the machine is going all the time, 30 or 40 feet will be destroyed. I am not able to give you any satisfactory estimate of the value in money of the loss which stoppage for meal times would involve; it would be very considerable.

They sometimes have accidents, get caught in putting the sheets round the cylinders after a breakage, or catch an arm in a strap.

We have a club on the works, to which I insist on every one of them subscribing, the men 2*d.*, the women 1*d.* per week. I give them 25*l.* a year and the fines except those for wilful damage.

If the proportion of younger hands is less here

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than in the south, the only reason is that they have a greater supply of young ones there; the factories here take them as soon as they are able to work. I don't think the factories in this district can suffer from the neighbourhood of unregulated trades. It may also be that more children are required for folding in the south, we don't make fine writing-paper here.

So far as I am concerned, we could devise so as to let the young ones go at 6 p.m., if we were under restrictions; but as to the half-time system, I would rather pay 2*s.* extra for hands over 13, than have half-timers. I think that Government should not provide education, but should make education up to a certain point a necessary condition of all juvenile employment. I have advocated these views in a pamphlet which I addressed to Lord Stanley some years ago, and I am now as much as ever convinced that they are right.

I object to special legislation; there should be one sweeping measure: there is no reason why the factories should be under regulation and not the paper mills. Night work might be almost entirely avoided; it is a mere question of capital, of extra hands and additional machinery.

The cases, which you tell me have occurred on my works, of children staying till 12 at night, and all night, are in direct violation of my express orders to the foreman; they need never occur at all.

160. *Mary Wallworth.*—Was 12 last Christmas. Have been over two years here. I feed the willow; that is very dusty. I have been ill two or three times with it; bad on my chest. Have once stayed away from work for a week. Can't read. Have been sometimes to Sunday school.

161. *Sarah Ellen Ramsbottom*, (waste sorter.)—Am going 10. Haven't been here so long; don't know how long. Can read a bit. Jesus Christ was our Saviour; don't know what that means; don't know what the word Saviour means. Go to Sunday school.

162. *Edward Mitchell.*—Was 11 last back end (autumn). Am scavenger; sweep dust up. Can read. Used to go to day school once. Never heard of Liverpool. Don't know what is the chief town in England. Don't know where Scotland is.

163. *Sarah Hall.*—Am 12 years old. Have been here some time; more than a year. Am "catching." At dinner time some one else comes and catches for me; sometimes I have a quarter of an hour, and sometimes half an hour, and sometimes more. Used to work in rag chopping; that was very dusty. Once or twice worked then till 12 at night; am quite sure I did. Have stopped at catching till 9 p.m. once or twice a week; often till 7 p.m. We all come at 6 a.m.

164. *Thomas Wheeler.*—Am going 12. Have been here two years; have worked all day and all night three or four times. That was at this machine; was a picker-scraper: like this catching best, that is so wet.

165. *Harrison Mosley.*—Am going 10. Am a picker-scraper; use a wooden rake to get the dirt off the picker. Worked till 10 p.m. last night; have done so quite a dozen times since Christmas (4 months). Am always very tired then.

166. *Samuel Mosley.*—Am 14. Have been three years here. Am catching sheets from the cutting machine. Stayed till 7 p.m. two or three times last week. Have stopped till 9 p.m. many times.

167. *Charles Mitchell.*—Am 13 years old. Scrape the picker. 9 p.m. is the latest I ever stayed. Left at 7½ p.m. last night; at 8 or 9 the night before; stay till 9 two or three times a week. They won't let us work after 9 p.m. now; last night I worked till 7½; was later the night before; don't know how late.

[168. Very few of these and the other children, from 10 to 14 years old, whom I examined could read properly; three or four of them made mistakes even in their letters as they spelt the words out; more than one could not read the word "Sunday" in large type.]

Messrs. H. and G. Coop, Heap Bridge, Bury.

86 persons are employed here; 37 of them are women and girls; 8 of the girls are under 13, and 12 more under 18; there are four boys under 13, and 11 between 13 and 18.

169. *Edward Barrington.*—As Mr. Coop is engaged, he wishes me to go round with you. I have been in the work ever since I was 12 years old, so can tell you something about it.

Our rag engines and paper machines work day and night, but there are only nine persons in each relay, six men and three boys; one of the boys is under 13. For all the rest the regular hours are 6 a.m. to 6 p.m., but that is at times exceeded; we worked for the first two months of this year till 8 p.m., but have not been later than 6 p.m. since*: the smaller ones get very tired by 8 o'clock. 25 of the women and girls are sorters, some of rags, but most—20 of them—of African grass, that is much less dusty; we have only lads and men at devilling. The rag-chopper makes a tremendous dust, none can stay more than a few months at a time at it. That is old bagging they are feeding in: that is always dusty. The boys' work at the back of the chopper, taking out the rags, is very dusty.

Our cutting is done by a separate machine; the sheets are brought up to this floor by a hoist. The women who sort the sheets keep rags on their hands to prevent the sharp edges from cutting them. The boys' fingers get nipped now and then, and broken sometimes; that is generally done in trying to pass the paper on between the cylinders after it has broken.

The machine hands never stop for meals, they sit down and watch the machine, and take it easier.

I don't think any part of the work is bad; none of ours stop away for illness. For the first three or four days after beginning they are generally poorly in the morning; that I think is more the coming to work before breakfast when they are young and not used to it: that soon goes off. The chlorine which is used after washing for the bleaching-up is only bad when they do it in a hurry, and so make it very strong. I remember being made ill for a week almost by getting into the smell of some when they were using it very strong. Sometimes the gas comes out of the chambers, and you can smell it half a mile off; it nearly chokes you; but that doesn't do any harm that I know; we always take our time about it, and so don't suffer.

Some of the youngest boys carry the half stuff to the engines, fill the skips with it, and wheel them off, that boy, Kay Howarth, is one. I believe he is correct in saying that he is not 10 years old, and has been two years here. He has 3*s.* a week. Some of the older boys have to count the sheets over; that is very nice work; they will get 7*s.* a week.

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* Evidence taken in April.

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THE STANDISH PAPER MILLS.

The rooms here are clean and lofty; at the date of my visit the machine room was unfinished, but great care seemed to have been taken in building it, to ensure ample space and proper means of ventilation.

170. *Mr. Horrocks*, manager.—The work in paper mills is not necessarily unhealthy; but if the work goes on in places which are not properly contrived for it, it may be so. The rag sorters often have to work crowded together in dusty rooms, all stifled up. Sometimes you have 40 or 50 women together in one badly ventilated room. The machine rooms also are many of them badly built, and become far too hot. But the chlorine gas, which is used for bleaching, is the worst thing of all; it gets on the lungs and makes you spit blood; it gets over the whole works at times, where proper precautions are neglected. We have pipes in our bleaching chambers to carry the gas away. When the bleaching is done in a hurry it is used strong, and then is very bad; the lads and women would be just as likely in most mills to be exposed to it as the men, although they don't work in it.

Our hours are from 6 a.m. to 6 p.m. now: we used to work night and day; then we came down to 14 hours, 6 a.m. to 8 p.m.; and now we find we can generally do with 12 hours. We have about 70 persons employed here, one half of whom will live in the cottages on the premises, and the rest in the neighbouring villages. Some dine here, but they are not tied to hours, and work in their meal times if they please; most of those who live in our cottages always go home to their meals.

We have had no accidents for four or five years. I have heard of some bad ones in other mills. They chiefly occur through carelessly shifting a strap, or through being caught between the rollers in helping the sheets of paper through.

In mills where the men drink some will be off work, and so others stop late to do their work, and arrange it among themselves, so that the master shan't know; that is how long hours are often made.*

The children, especially those catching up, will have to stop late if the men at the machine do.

There would be one good thing if an Act passed to bring us under factory regulations; a bell would ring for all the times of beginning and leaving off work, meal times and all, so that every body would cease at the same hour. I don't know any reason why the half-time system should not apply to rag sorters and catchers under 13. We have very few of that age.

171. *Ellen Reid.*—Am 40 years old, sometimes pick straw, and sometimes work at straw-cutting machine; the dust of it does me no harm. I have been here six years, and have had better health here than I used to have when I was charing and doing house-work.

172. *Eliza Lee.*—Am 23. Have been at it for six years. Worked in cotton factory before, was reeler there. Prefer rag sorting here to that. It was so hot.

173. *Margaret* ——.—Am going on 17. Have worked here for two months cutting or picking straw. Work about twice a week at cutting; the dust does not make me cough. Was weaver in cotton mill for five years. Like this better; there is more air and more change.

174. *Eliza Hall.*—Am 21. Work at the rag-chopping machine. Have been 9 or 10 years here. Have worked now and then from 7 a.m. to 8 p.m., perhaps once a week, not more. Have not done so yet this year. Don't mind the dust much. Would rather be working here this summer day than in the hay-field; used to work in the fields, but like this best, the hours are not so long.

175. *Jane Huddison.*—Am 17 next week. Have been here six months. Have not been off work once from illness. Work at chopping machine; that is better than work in the fields.

176. *Mrs. Marsden.*—Am 20. Sort the paper now, used to sort rags, that was dusty. Was once ill for three days with the dust, it made me feel sick and cough.

177. *Isaiah Harston.*—Am going on 16. Was catching boy 18 months since; began that at about 14. Was skutcher (at the willow) before that. Have worked for three or four nights together in some weeks till 8 p.m.

178. *Martha Rosthern.*—Am going on 16. Have been three years here. Am paper catcher at the machine. Come at 6 or 7 a.m., and stay sometimes till 6 or 7, and sometimes later; have stayed till 8 or 8½ and 9 p.m. every night this week, that was at sorting after catching was over. Have come to work at 5 a.m. occasionally. That man generally whistles on me at 7 a.m. to call me to work.

[179. The man who had the management of the paper machine at which this girl was catching, explained to me that for the sorting she was paid extra, by the piece; and so she would come of her own accord, perhaps an hour before the machine began, or stay an hour or more after the engine had stopped, to earn some more by that means; but such extra work was in no sense compulsory.

180. One of the men whom Mr. Horrocks sent for, told me that in some paper mills where he had worked, the "vitriol" used in bleaching got on the lungs of the persons employed there, and made them cough and spit, and their nose run, and that some were frequently absent for one or two days at a time from the effects of it.]

181. *Mr. Rideout*, (the proprietor of the Standish and the Farnworth Mills, to whom I read over the preceding evidence,) informed me that pure chlorine gas was very generally used in Lancashire instead of chloride of lime, or of potash, the chief reason being that the salt, of which with manganese and sulphuric acid it it composed, was obtained at a less expense there than in most places. The exact amount of gas required for bleaching a given quantity of stuff is determined solely by the "rule of thumb," *i.e.*, the experience of the workman, and varies of course with the amount of colouring matter to be decomposed. In his opinion the bleaching stills should either be apart from the rest of the works, or be so arranged as to admit of steam being passed through them and carried off by pipes; the effect of that being to remove the surplus chlorine, by reason of its affinity for water, in the form of hydrochloric acid and oxygen.

With regard to accidents, he mentioned three as being within his own recollection, all more than four years ago; one, a case of a man whose foot had slipped while he was oiling part of the machinery which was in motion; the second, that of a girl who had only been a day on the works, and was caught as she helped her father at the straw-cutting machine; the third one where a boy, playing with another, put

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* Mr. Rideout considered that such cases would now be very rare, and confined to places in which water power was used, and "butty" work the custom of the workmen.

Paper Mills.

Mr. H.W. Lord.

Lancashier.

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his finger on the cog-wheel to show that he could do as much as the other; he did not draw it away in time, the finger was crushed, and erysipelas ensuing the boy died.

Fans had been adopted to remove the dust occasioned by the chopping machines, and with success; the mode being, not as in the cotton mills to lift it up through the roof, but to draw it down under the floor. He also considered that the shafting was safest if placed under the floor. He agreed with Mr. Horrocks (No. 170), as to the applicability of the half-time system, and fully recognized the importance of education; but wholly disapproved of legislative interference with reference to the hours of labour of adults of either sex.

> [In answer to some further inquiries as to the hours of work and absence of night work, I subsequently received from Mr. Rideout a letter, enclosing a "report" from his manager to him on the subject. I subjoin copies of both.]

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182. Letter from Mr. Rideout.

12, Wellington Street, Strand,
Nov. 2, 1864.

* * * *

The reason our machine does not work longer hours than those stated is that the rag engines, *i.e.* the *producers of the pulp*, are so proportioned to the wire surface of the paper machine that each runs equal times; for instance, if I ran the rag engines 24 hours, the machine would work 24 hours, or rather less, for I have so arranged the mill that, in case of need, the machine can overtake the rag engines; in other words, that the machine can consume a little more pulp that the rag engines can produce, and thus it always overtakes or keeps out of the way of the rag engines.

I am satisfied that there is no economy in NIGHT work.

P.S. It is necessary to tell you that the machine a Standish makes nothing but "news," and the production is very regular and constant. A machine upon miscellaneous papers cannot be timed with regularity.

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183. REPORT ENCLOSED.

The beating mill works from 6 a.m. to 8 p.m. for 5 days, and from 6 to 3½ on Saturdays, without stoppage. The white machine works from 6 to 6 for 5 days, and from 6 to 3½ on Saturdays. The brown machine works from 7 to 5 for 5 days, and from 7 to 3½ on Saturdays. They both run without any stoppage.

The stewers and bleachers work from 6.30 to 5 for 5 days, and from 6½ to 3½ on Saturdays, and have 1½ hours each day for meal times. The scutchers and sorters work from 7 to 5 for 5 days, and from 7 to 4 on Saturdays, and have 1½ hours each day for meal times.

MR. T. B. PARKE, WITHNELLFOLD, CHORLEY (AUG. 1863).

102 males and 58 females are employed here: 10 boys and 8 girls are under 13 years old; the youngest boy is 9 years and 6 months old; the youngest girl is 10; the rest are all over 11. Between 13 and 18 there are 13 and 14 females.

184. *Mr. T. B. Parke.*—I make goods of various description, and my orders are very irregular and often pressing. The most pressing perhaps are those from Her Majesty's Stationery Office. I cannot work to stock, for until I have the orders, I don't know what class of paper will be wanted.

Six months ago I had only about eight under 13; the rest have been taken on since to work at the glazing machines, which are new; in a year or two they also will be over 13; I shall not take on younger ones, for they will stay with me doing the same work they do now, for they are only learning.

The work at the paper machine is divided into night and day shifts of 12 hours each. All but one employed there are adults.

The girls who are engaged in sorting the paper occasionally work late for two or three days. They are over 13. Those whom I have under 13 do not stay half a dozen times a year after the usual hours. Sunday work I never allow on any pretence; that can always be avoided: I would not allow it to complete an order for any person.

The cutting machines, those for cutting the paper, are separate from the paper-making machines; that is better for the children who are at them; for besides being in a cooler atmosphere there is less overtime, since the cutting machine cuts several reels at a time, and so gains considerably on the making machine.

I have spent a good deal of money and pains on my schools, and insist upon the parents sending their children there before they are taken into the mill. I could not work the half-time system, because the population in a country district as this is, is too scanty.

I could not work my mill under the restrictions provided by the Factory Act.

The Bleach Works Act will not do for paper makers, because the work is so irregular, and can only be properly explained by an inspection of the mill.

I consider that I do individually act virtually in accordance with the intention of that Act, and it is just that irregularity which exists, and must necessarily continue in the manufacture of paper, that makes all the difference between working the hands according to judgment and principle and being *compelled* to do so in *detail by law.*

185. *Mr. Entwistle*, manager.—The younger ones at the glazing machines or calenders merely put the sheets of paper between the plates, which some a little older lift for that purpose. They earn from 4*s.* to 5*s.* a week in their day of 10 hours, from 6 a.m. to 6 p.m., with 2 hours for meals. There is a man to lift the "wad" of plates and sheets, and put them in the calender.

The "cutters" get 3*s.* at first, and rise to 4*s.* and 5*s.*; they are girls. After about two or three years they are put to sorting paper, for which the wage is more. The shavings have to be taken out of the hollow below the machine two or three times a day; they get a rest of 10 minutes then. They will probably work for 12 or 13 hours for two or three days next week, that includes meal hours and play. They usually work 10 or 11 hours a day. They often play when they are not wanted for a little while. The machine works slow.

Last night the children at the calenders were sent home at 7, and some of the older ones, between 14 and 18, took their places and worked till 10. That does not occur for more than 3 or 4 nights in a year. They had been at other work during the day. The work will not be so late to-night, because it is Saturday.

The rag cutters and sorters are never pressed; they always take it easily. The married women often stop at home to wash on Saturday. We generally stop on that day at 2 p.m. in that department, and at 4 p.m. elsewhere.

Our holidays are Christmas day, New Year's day, and Good Friday, and about a week in July. The time is not fetched up; and those who earn weekly wages have them paid all the same.

The waste pickers can get 10*s.* and 12*s.* a week; they are women or older girls. Just now we are obliged to use rags; they are far more dusty than the "shoddy," which we have in ordinary times, the cotton waste, that is, from the mills.

Two men were killed here, within two months of one another, this year. There had not been any serious accident for 20 years before. They were not caught in any wheels or gear so far as we know. Two lads of 18 have had the ends of their fingers nipped off by the bowls of the machine; and one lad lost two fingers at the rag-chopper. They were not accidents which fencing would have prevented.

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186. I also visited the mills of Messrs. Mangnall at Bolton, and Messrs. Potter at Darwen. There were very few at either under 18 years of age.

LETTERS from CLERGYMEN, MEDICAL MEN, EMPLOYERS, &c.

LETTERS from the REV. ———.

187.

Dear Sir, Oct. 3, 1864.

* * * The children leave school much earlier than they ought, so anxious are their parents to get them employment at the mills, or farms, or at embroidery ; this is bad for the children physically, farm work excepted ; but the chief injury arises from the night work in the mills, where many are kept on 24 hours at a time (and the same off) ; the effect of this night work is grievous in some instances, and it often prevents attendance at the night school.

We have had large night schools, and though the hours have been from 7 to 9 p.m., I do not think it tells against their health materially. The members of our night school and choral club look generally the most healthy in the parish ; after their long hours of labour, it is a marvel to see the spirit and delight with which they come, and when it is time to close, they are very loath to leave. * * * Believe me,

Yours faithfully,

H. W. Lord, Esq. ———

188.

Dear Sir, Oct. 14, 1864.

There is no doubt great difficulty in getting at the truth. It is not only that some do not like to confess their real feelings, but from habit, and being accustomed to a certain work, men do not see that it is noxious.

I have never specially considered the subject, for I have more than I can get through in my own immediate province ; but occasionally we have seen a lad looking very badly, and, on inquiring, his mother has said, "Oh, it is the night work," or "the journée" 24-hour work. One lad living close by was so a few weeks ago, and his work was altered for a time, and he is now much better, but I doubt whether he will ever get sufficiently used to it to stand it ; it would at any rate be better, if they were not put to such work till older.

I have been looking at our list for the night school, and almost all are shoemakers, some other trades and farmer's boys, but very few from the mills.

I am, dear sir, yours faithfully,

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189. LETTER from the REV. W. P. WOOLCOMBE.

Loudwater Parsonage, near High Wycombe,

Sir, Oct. 5, 1864.

In reply to your letter, I beg to say, with reference to the Loudwater schools, that the number of children who attend the day school is between 60 and 70, and their ages vary from 2 to 10. The number of those who attend the Sunday school is about 100, and their ages vary from 5 to 15 and 16. With regard to the condition of the juvenile operatives, most of them can read and write, and many attend the Sunday school. Hoping this information may be of service to you,

I am, sir, yours faithfully,

H. W. Lord, Esq. W. P. WOOLCOMBE.

The two following letters were written to me by a gentleman, who has had great opportunities for forming an opinion upon the matter, on which he writes.

I regret that reasons exist which, in his judgment, render it advisable that his name should not appear.

190.

Dear Sir, Sept., 1864.

I am glad that parliamentary inquiry has been directed to the results, social and moral, to the children of their employment in paper mills, and it will be my satisfaction, as well as my duty, in every way in my power, to help in such inquiry.

The facilities of profitable employment offered by the paper mills in this parish do induce children of both sexes to leave school long before their imperfect education can be considered in any way complete, viz., in almost every instance before the age of 13, while 12 is not a common age in either school, as the employment of the older children in the mills finds other employment, not in the mills, for children of 12 and thereabout.

This employment no doubt enables children to earn comparatively large wages, and thus, at a very early age, to be helps instead of burdens to their parents ; their association also with intelligent and skilled mechanics sharpens their faculties, and they undoubtedly acquire very early habits of application and industry. I doubt, however, sometimes, if the amount of work thus done is not beyond the average strength of their years, and so a bad economy of labour.

But as to their moral condition, as the result of this employment, there is much that is very painful to witness. The children, immediately that they pass from the school to the mill, throw over all kinds of recognition of their teachers, and of their previous training, and assume an absolutely independent tone, independent of parental, as well of all other authority. At once discontinuing attendance (except in very rare instances, where some personal pressure is brought to bear) at any place of worship, the children become rude and defiant in manner, and strangely coarse and lewd in language, and very soon fall into the gulf of indecencies and immoralities, of which it is difficult to believe their young years capable.

The well-conducted mothers, though themselves employed in the mills, are very unwilling that their own children should follow such employment.

But the self-indulgent and often luxurious habits of the skilled mechanic's class make the addition of the child's hardly earned wage a *quasi* necessity, though the results are, in far too many cases, just such as I describe.

I add in fairness that the occupiers of the ——— mills are, I believe, sincerely desirous that a tone of decency and respectability should prevail throughout the works. I wish with all my heart their good wishes were followed with adequate results.

I regret that I must ask that the statements, which it is thus my duty to make, may not be made public in their present form unnecessarily, nor that my name be attached to them, unless where their due authentication on the "public service" may require.

191.

Dear Sir,

I thank you for your full and frank letter of October. I have carefully considered the courses you therein suggest as to the publication or non-publication of the evidence, which I thought it my duty to give, and, though I have very carefully verified its accuracy, and satisfied myself of the exact correctness of its statements, I have still come to the conclusion that it will be wisest and best for me to ask you to consider that evidence as entirely *confidential*, and therefore, if published at all, to be published with your name, not mine, as information gained by you, whose author's name you are not at liberty to divulge.

Believe me, with much regret that peculiar local conditions make such request necessary.

Faithfully yours,

H. W. Lord, Esq. ———

192. LETTER from E. MOORE, Esq., Surgeon.

Sir, Dartford, Sept. 21, 1864.

I FIND that employment in "the rags" has been assigned as the cause of consumption, asthma, and gastric disorder, which varies from slight loss of appetite to the more obstinate cases of severe dyspepsia.

The heat of the "machine room" I have heard persons complain of, but I have not known any injurious effects produced thereby.

Occasionally boys come to me with the tops of their fingers cut off, but they usually attribute the accident to their own carelessness, so I presume that every precaution in the way of "fencing" the machinery is adopted.

I find many cases of not, perhaps, downright chlorosis among young women, but that pale anæmic condition, which is owing to a deficiency of red particles in the blood, and is relieved by steel.

I have seen several cases of imperfect development of the system, two of the best marked being sisters. Here the bones were disposed to be rickety, the breasts not developed, and there was such a juvenile appearance that I took them to be about 15 years of age, when they were about 25.

My acquaintance with these cases is very short, as I have been only about ten years in this neighbourhood. * * * *

I am, &c.

H. W. Lord, Esq. EBENEZER MOORE.

EXTRACT from Letter from H. L. POMFRET, Esq., Surgeon, HOLLINGWORTH, near MANCHESTER.

193. I have no way of arriving at the number of accidents in paper mills, but they will be very similar both in nature and number to those in print works, arising pretty much from the same cause,—exposed mill gearing and dangerous machinery. In my opinion both ought to be reported as in factories, that proper fencing may be secured. It is not very long since I assisted at the amputation of a child's leg, who had been caught by a shaft that the child had to stride over in taking its father's dinner to a paper mill.

On reflection I should say that there is more dangerous machinery in paper mills than in print works for the number of hands employed.

I have frequently, as the certifying surgeon for the district, had to refuse children as "too young*" for the factories, who I have been told had been working for months in the paper works, and would no doubt return there.

194. EXTRACT from Letter from MR. JAMES CROPPER, BURNSIDE MILLS, KENDAL.

The number of children under 14 employed (in Burnside Mills) is not large, perhaps 8 to 12, and with them I have frequently adopted a half-time system, employing them alternate weeks, and giving them schooling meanwhile. I should think this plan might be adopted at most paper mills easily. The work here is 10½ hours a day. The night work is not regular; but usually two boys work all night in turn, and sometimes a third. For my own part I should be glad to be under the Factory Act, because it would make it easy to carry out rules which now, by the carelessness of the parents and the mill foremen, are often broken.

There are other young persons from 14 to 18 years of age employed, both boys and girls: the boys as apprentices, but very few in number, the girls as paper sorters or rag cutters; these last work only during the day, and never more than 12 hours, usually 10½; their number varies from 12 to 20.

I think you might with advantage take paper works into the category of trades to be regulated by law.

195. LETTER from NATH. GRACE & Co., Paper-makers.

Scotswood, Newcastle-on-Tyne,
Sir, 14th Sept. 1864.

IN answer to your note respecting the employment of children and young persons in the paper-making trade, we beg to state that in brown paper mills, such as ours, the numbers are not large, indeed we may say very limited; we seldom employ any under 14 years of age, they are too young for our purposes. We have now from 10 to 12 girls between 14 and 21 years of age, and we believe that we have more than any other mill in the district. Of boys we have six to eight between the same ages; some of these are learning the trade.

We may further state for your information that paper mills in general are worked night and day, double-shift as it is termed, but the hands required to keep the paper making machinery in operation during the night are very few, the principal part of the workpeople being employed during the day only. In our case, out of nearly 70, only seven are engaged at night, three of these being youths; and this proportion will apply to other mills of a similar description. Of the white mills we are not in a position to give any account.

Our trade is not by any means an unhealthy nor yet a dangerous one. Accidents with us are very rare, and generally arise from want of ordinary care.

Whenever a vacancy occurs we have generally a number of applicants, as young persons, especially females, are constantly soliciting for employment.

In any changes that may be in contemplation we hope the paper trade may not again be singled out for proscription, as it is already sufficiently doomed by recent unfair legislation, and we have enough to do to exist against foreign competition. The number of young persons employed, as it is not an extensive trade, can form but a very small proportion to those employed in the general trades, such as the iron trade, glass trade, pottery ware, mining trade, &c, &c., any one of which, we feel assured, employs far more young persons than the paper trade, the total number of persons employed in it being estimated at only 100,000.

We venture to hope that if further legislation on the subject be considered necessary, instead of partial and limited measures only being introduced, provision will be made to embrace all trades in one common comprehensive scheme.

We are, Sir,
Yours very respectfully,

P. Selby, Esq. NATH. GRACE & Co.

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* *i. e.*, for full-timers.—H. W. L.

Paper Mills.

Mr. H. W. Lord.

Lancashire.

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196. Letter from Alex. Cowan and Sons, Paper-makers.

Valleyfield Mills, Edinburgh,
10th Sept. 1864.

Sir,

We have received from our house in Edinburgh your favour of the 7th inst., along with your circular to employers dated April 1862.

We employ at our works above 500 hands, of whom about two-thirds are females; many of both sexes are young, but scarcely any can be designated as children, for the following are the rules on which we have acted for the last 25 years or more:—

1. All applicants for work must have completed 13 years of age and be of good character.
2. All young persons must, prior to admission, be well versed in reading, writing, and arithmetic, and in the case of girls, in sewing.
3. All boys must till they are 21 years of age attend an evening class provided for them at our expense for three months each winter. Girls may attend a similar class, but it is not compulsory on them.

Yours faithfully,
Alex. Cowan and Sons,
Paper-makers.

Prideaux Selby, Esq.

P.S.—We may add that, with a view to prevent the neglect of children in their homes, we do not employ mothers of young children in our works, unless in the case of widows or women deserted by their husbands or having hubands unable to earn a livelihood.

On certain PAPER MILLS in DEVONSHIRE, SOMERSETSHIRE, and near LEEDS, YORKSHIRE.

To Her Majesty's Commissioners.

Gentlemen,

On certain Paper Mills in Devonshire, Somersetshire, and near Leeds, Yorkshire.

1. I have visited the large paper manufactories at Ivy Bridge and Hele in Devonshire, and at Bitton, near Bristol, and a few others at Leeds, and beg to forward the evidence I have taken at these places. As I believe the paper trade has been the subject of a more general inquiry on the part of another Assistant-Commissioner, I shall only make a few observations with reference to the evidence I have obtained.

Mr. F. D. Longe.

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2. The principal class of persons employed in the larger mills which I visited are women and girls. In both the mills which I visited in Devonshire, there were about 150 women and girls employed, part of them in rag-cutting, and the others in glazing, calendering, and sorting the paper when made. Out of 72 calenderers employed by Messrs. Somerville at Bitton, near Bristol, 50 were stated to be under 15 years of age. (Evid. 12.) The girls employed in all these factories in each department begin at about 13 or 14. I found very few under that age. The rag-cutting is very dusty work, but the rooms I visited were large and open. This work is only done by daylight.

3. The glazing and sorting is a clean and healthy employment. The calendering rooms in the mills I visited at Leeds were very hot. The hours of work in these rooms are generally confined to between 6 a.m and 6 p.m.; but these hours are in some cases liable to be greatly exceeded when the ordinary system of work has been disarranged through accidents to the machinery. (Evid. 17.)

4. The class of workers whose employment seems to call most for consideration in this trade are the boys who take the paper from the cutting machines. There were altogether about 80 young boys between nine and 13 employed at this work in the mills I visited. The peculiar character of their work is the incessant attention that is required during the whole time they are working. They sit at the end of their machine, which is incessantly throwing out sheets of paper, which have to be caught up by the boys and laid in order. The machine does not permit a moment's relaxation from this monotonous work so long as it is in proper operation. The paper machines are liable to be stopped sometimes, but their rests are only exceptional.

The "paper-layers," or cutters, work in relays by day and night. There are two or three regular boys to each machine, with another boy employed near by, ready to relieve them for short periods at dinner or breakfast time. One boy stated that he only stopped five minutes for breakfast and dinner. (Evid. 2.) There seems to be no regular time for their meals. The machine is never stopped except when something goes wrong.

5. At the Hele paper mills in Devonshire, Mr. C. Collins has for some time carried out a system of compulsory schooling with all the younger hands in his employ who are unable to read, write, and cypher. He requires such children to attend school for one hour every day, from 5.30 to 6.30. Half this hour is out of their regular time of work. There were eight boys and 30 girls attending his school on account of this rule when I visited his works. Mr. Collins spoke strongly of the good effects this system of education had on the general habits and behaviour of the hands he employed. (Evid. 6.)

I am, &c.
Francis D. Longe.

EVIDENCE.

Evidence.

On certain Paper Mills in Devonshire, Somersetshire, and near Leeds, Yorkshire.

Mr. F. D. Longe,

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Messrs. Allen & Sons, Paper Manufacturers, Ivy Bridge, Devon.

1. *Mr. John Allen.*—We employ between 300 and 400 hands altogether, and about half of them are women and girls. There are three branches of work in which the women and girls are employed, (1) rag cutting ; (2) glazing paper or calendering ; (3) sorting. In the rag-cutting rooms there would be a few under 18 years of age, but none under 13. In all three departments the girls are nearly all above 15. The worst employment in the whole trade is dusting the rags previous to their being put into the boiler. Only one woman is employed at this work. There are seven or eight women who take this work by turns. The men and the boys are employed, (1) in boiling the rags ; (2) in washing and bleaching ; (3) in attending the paper-making machines. The youngest boys are employed in laying the sheets as they come out from the cutter. The machines are kept going night and day. It would be impossible to make the machines pay at all if they were only worked in the day. We have two sets always employed on each machine. The rag-cutting and sorting paper is only done by day-light. The glazers work from 6 to 6. We never worked a whole week to 8. On Saturdays all the women leave at 4 o'clock. The machines go on to 11 on Saturday night, and begin again at 12 on Sunday night. All the hands, except those employed at the machines, have a regular hour for dinner, and half an hour for breakfast. Nearly all leave for meals.

Machine Room.

2. *William Prowse.*—I shall be 12 next week. I have worked here not quite a year. I lay paper. I work from 12 to 12. I generally change at 12 o'clock. I work from 12 o'clock at night in one week, and from 12 o'clock in the day he next week. At the other machine they work from 8 to 8. The machine sometimes goes on the whole day without stopping. There are two other boys besides me. We are all at work sometimes. The machine sometimes stops an hour or two when the men are altering it. When the machine is going on, we generally stop about five minutes for breakfast, and about five minutes for dinner. There is no regular time for meals. There is another boy to take my place when I stop for meals. I get 4*s.* 6*d.* a week—the master pays me. I have been to school a little while. I can read the spelling book. I was about 12 months at school. I go to Sunday school nearly every Sunday. I have three sisters and two brothers.

3. *Thomas Hussey.*—I am 14 next May. I have been one year at work. I jog. I come at 8 o'clock. I go away at 8 at night. I get my dinner at about half-past 12. I get my dinner here. I generally take about a quarter of an hour for dinner. I sometimes lay paper for the other boys. I lay for them when they get their dinner and tea. I give half an hour for each boy at dinner time, and 20 minutes at tea time. I laid paper for a month. I get 9*d.* a day for jogging. Before I came here I went to school. I was three or four months at school. I can't read. I go to Sunday school now every Sunday. On Saturday, when I am on the day term, I come at 8 o'clock in the morning, and leave at 12 ; and I come again at 12 o'clock on Sunday night, and leave at 8 o'clock on Monday morning.

4. *John Lowther.*—I am going 7. I don't know how old I am. I think I am going 7. (He was over 14.) I lay paper. I begin at 8. I shall give over at 8. I stopped half an hour for dinner. I always stop half an hour for dinner. I generally stop 10 minutes for tea. The machine has gone on all day to day without stopping. Yesterday I stopped from 11 to 12. I get 9*d.* a day. I don't know how much I get a week. I take my money. Before I come I drove an engine. I was a year at that work. Before that I went to school. I was only one week at school. I can't read.

5. *Henry Hussey.*—I shall be 10 next May. I have worked here about four months. When I work at night I come at 8, and leave at 8 in the morning. I stop about 10 minutes for supper, or a quarter of an hour. I only stop once during the night. I work to eight o'clock. I can't read. I have been three or four years at school. I get 9*d.* a day.

At Mr. C. R. Collins' Hele Paper Works, Collumpton, Devon.

6. *Mr. C. Collins.*—I employ about 250 hands, of them 80 are men and boys, and the rest women and girls. Nearly all the men and boys work in shifts of 12 hours, to from 6 a.m. to 6 p.m. No females are employed at nights. The youngest girls are employed at cutting rags. There are very few females under 15 employed at that work ; there may be some as low as 14. The younger boys are principally employed at the cutting machines. The youngest boy in my employ is 11 years old. He has just begun. There is always an extra boy to take the place of one of the cutters at their meal times. The cutter may take half an hour or three quarters of an hour for meals. I never allow any boy to be employed in the works unless either they can read and write and cypher, or go to school an hour every day. There are now about eight boys and 30 girls going to school every day on account of that rule. I allow them half an hour out of their regular hours of work ; they go to school every day at half-past 5 p.m., and must remain an hour at school. For this I charge them 1*d.* a week. I have carried out this rule for six years, and find no inconvenience attending it. It decidedly has a very good effect on the general character of my hands when they grow up. I don't allow any workpeople's own children to come at all until they can read and write.

7. *Richard Squire.*—I was 10 on the 28th of last July. I have worked here three months. I lay paper. I work on night and day shifts. When I work on the day shift, I come at 6 in the morning. I go away at 5 o'clock. I stop half an hour for breakfast, and half an hour for dinner. I get my tea at home. The machine stops nearly every day about half an hour or an hour. I may go a whole day without stopping. I can read and write, and know arithmetic. I was six or seven years at school. Six times seven are 42. There are 100*s.* in 5*l.* I read the Testament and little books at home.

8. *William Woolley.*—I am 12. I have worked here three years. When I came I had to go to school. I have to go to school now. I go at five o'clock at night. I stop an hour at school. I go every night except Fridays and Saturdays. I am learning to read and write. I can read and write well enough to be let off school now. There are three other boys who go with me. I get 8*d.* a day. On Saturday I work ~~to half-past 11~~ at night. I lay paper.

9. *John Hogg.*—I was 14 last July. I have worked here about 16 months. I can read and write. I go to school an hour when I work in the day. When I work at night, I come at 5 o'clock. I get up at 4 o'clock. I go to bed at 9 o'clock in the morning. Sometimes I go to school on Sundays.

10. *Thomas Thorne.*—I am 16 to-day. I attend to

On certain Paper Mills in Devonshire, Somersetshire, and near Leeds, Yorkshire.

Mr. F. D. Longe.

p.

the machine. I have been at this work two year. I work on day and night shifts. I come at 6, and I go away at 6. There is always another shift comes on at 6 o'clock. When I first came I laid at the cutters. I was two years there. I could read and write when I came. I had to go to school for an hour at night. I don't go now. I used to leave at 5 when I went to school. Now I work to 6.

11. *Thomas Bowden*—I am 14 next month. I assist at the engines. I have worked here going on for four years. There are two shifts at this work. When I work in the day, I come at 6. I stop three quarters of an hour for breakfast and dinner. At night, I stop from 9 to half-past 9. I stop again at 2 o'clock for half an hour. I never stayed away but once since I have been here. I never catch cold. I can read and write. I go to Sunday school now. I do not go to school on week days.

MESSRS. SOMERVILLE & SONS, BILTON, NEAR BRISTOL.

12. *Mr. W. Somerville.*—We have two machines at work, one only doing the night just now. We have not hitherto worked more than one night and day. The only hands employed in the night are the engine and machine men, and the boys employed at catching the paper from the cutter. The rag-cutting is only done by daylight. The glazers only work from 6 to 6, never after that. We have about 72 calenderers, men and women. 50 of them would be under 15; none of them are under 12. They are generally about 14 years old. We have three under 13.

13. *Annie Jones.*—I was 12 last month. I have worked here six months. I work in the calendering room. I come at 6. I go away at 6. I never worked after 6. I go away to breakfast at 8½. I come back at 9. I go away at 1 for dinner and come back at 2. We are allowed at ten minutes at 11 and at 4 o'clock to rest, or run out. Before I came I went to school. I can't read very well. I was reading the Bible when I left. I was at school, since I was four years old.

14. *Samuel Lindley.*—I was 14 last March. I work at the machine. I only began there last Saturday. Before that I took up paper. I was two years at that. I worked from 6 to 6. I come at 6 in the evening and leave at 6 in the morning when I work at night. I keep the same hours now. There are four boys working here. Three at a time and one waiting. I get my breakfast at 8½. I get it here. I get my dinner here too. I have an hour from 1 to 2 for dinner. I always stop an hour. The machine does not stop. Before I come here I went to school 2 years. I can read the Bible and Testament, and third class-book. I get 5*s.* a week. I got 3*s.* 6*d.* when I looked up paper.

15. *Edwin Jeffries.*—I am going 12. I have worked here four months. I catch paper. I work on both turns. I come at 6 at night. I have half an hour or an hour for supper. The other boy takes my place. I get my supper about 9 o'clock. I don't stop again during the night. I was at school before I came here. I can read at Sunday school.

AT MESSRS. STOCKS & SONS' BRITANNIA PAPER MILLS, LEEDS.

16. *Mr. John Stocks.*—We have three little girls under 13 years of age, employed as paper cutters, and one or two ltttle boys in the works. We have no lads employed in the rag-cutting room. The men who cut the rags carry them to the boilers.

Calendering room.

17. *Sarah Benton.*—I have worked here five years. I began at the cutter. I now calender paper. I come at 6, and leave at 6 at night. I have worked twice through the night; one time I worked through the following day too. At that time the engine was out of repair. We have been working to 7 from a week before Christmas. We generally begin in this room at 6½. We are paid by the piece. We get more money when we work later. We breakfast at 8. The machine never stops for breakfast. We generally stop about half an hour. We always stop an hour for dinner at 1, and half an hour at 4 for tea.

18. *Ruth Naylor*, paper cutter.—I catch paper. I am going 12. I get 3*s.* 7*d.* a week. I begin to work at 6½. I go away at 6. On Saturdays I go away at 4. I have worked to 7; I never worked to 8. I have worked to 7 for three weeks, every night. I get 7*d.* a week extra. I worked at Roberts' at making paper bags. There were 20 little girls there. About three were smaller than me. I got 3*s.* a week wages then. All had regular wages. It was a nice room. We had to work. We stood while we worked. We got tired of standing. This is easier work here. We havn't got to stand. (Can read a little.)

19. *Ambrose Martin*, foreman.—I have been in a paper manufactory either as a paper maker or a manager for 30 years. I consider it a very healthy trade. I have never known girls to suffer from the heat of the calendering room. They generally marry when they leave us, and I know now several healthy women who were calenderers.

20. *Sarah Ann Foxcroft*, paper bag maker.—I used to work at Roberts'. I was 11 when I first went. We worked there regularly from 6 to 7. I was the youngest there when I first went. I know that there are several now of about 10 and 11 years of age. I do not know that there are any under 10. The girls there have weekly wages, and the women keep them up to their work. I always go home to breakfast, dinner, and tea, when I work to 7. I both sit and stand as I work. Our wages are 7*s.* or 7*s.* 6*d.* per week.

REPORT upon the GLASS MANUFACTURE.—
By Mr. J. E. WHITE.

To Her Majesty's Commissioners.

The Glass Manufacture.

Mr. J. E. White.

Q.

Importance and growth of the manufacture.

Gentlemen,

1. The glass manufacture of the United Kingdom is one of great importance, not only in its commercial value, but also as regards the number of persons employed in it, and the circumstances of the employment. It has, as represented, very largely increased since the time of the inquiry under the former Children's Employment Commission. One of the chief causes to which this result is attributed is the repeal of the duties which pressed upon the manufacture, and some of which interfered much even with the mode of conducting it. The removal of such restrictions naturally led to important improvements and cheaper and increased production. But the manufacture, though passing under one simple name, is so varied in character that it has been influenced by a variety of causes in its different parts.

Extent of inquiry.

2. I should remark here at the outset that though I was directed by you to make an inquiry into the glass manufacture of the United Kingdom generally, this was subject to the important exception of Lancashire, the glass works in which fell under the local inquiry of another of the Assistant Commissioners, and for a like reason I excepted a few of the works in Yorkshire.

Four main branches.

3. To give any clear idea of the manufacture as a whole, it will be necessary to treat of some of the chief parts or divisions of it separately. It comprises four main branches, viz., (1) plate glass, (2) crown and sheet glass, (3) flint glass, (4) bottle glass; with some further varieties or subdivisions. Not only do the kinds of glass, but also the nature and system of employment to which they give occasion, vary greatly, and they will in several cases require separate notice, as much as if they were entirely distinct manufactures.

Plate glass.

4. Plate glass is well known as a superior kind used for large smooth surfaces, as windows and mirrors, but a rougher kind is used also for some other purposes. It is made by casting, the metal being poured out from the pots on the surface of a table, and there rolled out flat by machinery.

Crown and sheet glass.

5. Crown and sheet glass are the kinds in common use for window glass. Both are made by blowing and manual labour. There is no essential difference in the nature of the process. Crown glass is blown in a bulb shape, which is opened and spread out by whirling into a large flat disc; all done by the glass blowers at the time of making. Sheet glass is blown in a longer shape, which is drawn out by the weight of the glass while swung in a pit beneath the glass blower till it becomes a long hollow cylinder. This, when cold, is slit up from end to end with a diamond, and again heated and flattened out in a kiln. The rectangular shape thus obtained gives sheet glass a great advantage over the crown glass, which, being circular, and unavoidably having a knob in the middle, where it was attached to the glass blower's iron, will not cut up into such large panes, or with so little waste. The sheet glass blower's iron leaves no mark, the part to which it was attached being one of the ends which is cut off.

Flint glass.

6. Flint glass is the kind used, not for mere flat surfaces, as plate, crown, and sheet glass are, but for useful or ornamental articles of all kinds, in which, as a rule, purity of substance and elegance of form, requiring often highly finished workmanship, are sought for, such as table glass, lamps, &c. Formerly it was made only by blowing and manual work, but of late a less costly kind, called "pressed" glass, made with the help of machinery, has come into great and increasing use. Flint glass also includes a great variety of small miscellaneous articles of inferior kinds, such as medical and perfumery glass, &c. Moulds are also used for blowing some of this glass in. Some medical glass is made in dwelling houses with gas and a blow-pipe.

Bottle glass.

7. Bottle glass consists of common wine, beer, and other bottles and vessels of almost all kinds and sizes, *e.g.*, from the smallest pickle bottle up to large jars holding several gallons, such as are made chiefly for use, with little or secondary regard to appearance, and therefore of coarser material and rougher workmanship. The bottles are made by blowing in moulds. The "black" or dark bottle was the kind chiefly used for common purposes, but common bottles are now made also pale or tinted with different colours as well as black. Some kinds of bottle glass work differ little from inferior flint glass making, and in some cases the two businesses are carried on together.

Stained glass.

8. The so-called manufacture of stained and ornamented glass for windows and other pictorial designs is not a distinct and independent kind of glass making, but rather an art employed in finishing and making up glass coming under the former heads. The business is carried on chiefly by manufacturers who do not "make" glass at all, but get it from those who do. Colour is added in a variety of ways, as by means of a solution, or an enamel, or paints applied to the surface and burned in.

9. Now, however, glass of a given tint can be made in the crucible or pot in just the same way as common uncoloured glass, thus having the colour inherent in its own substance. This is regarded as a great improvement on staining, as securing permanent and brilliant colour, and indeed the excellence of the old glass is attributed to its having been made in this way, though the art was lost till lately. Further colour or shading may require to be added on the surface in parts, as described above, in order to form a given design. When what colouring is needed is completed, the separate pieces of glass are fitted together, as the design requires, by framing or glazing.

10. It is found that the uneven surfaces obtained by the old and less perfect manner of glass making are better suited to give richness of colour than the improved modes now in use for common glass. Hence some of the best stained window glass is now made in the original manner, and from this cause in one manufactory I have seen flint glass blowers employed, as they are when required, in making window glass, as the glass, though made in much the same manner as cylinders of glass are by sheet glass blowers, is of small size, and requires a labour more resembling that of flint glass blowers. This supplies a connecting link between what are now usually carried on as two entirely distinct trades.

11. Painting or enamelling window glass, especially in its simpler forms for producing semi-opaque or patterned windows for passages, &c., is in some cases carried on in departments of ordinary glass works.

Mosaic.

12. A new kind of art, in which opaque coloured glass is used to form designs by inlaying, as mosaic, or to form a basis for indestructible frescoes, has also been introduced, but not on a scale to require further notice.

Miscellaneous glass trades.

13. A few other miscellaneous kinds of glass work of the same nature, or consisting of embossing glass by eating off a coloured surface with acid, so as to form patterns or words, or bending window glass into curves, a work of the same nature as that performed in the flattening kilns in sheet glass works, are also carried on upon a small scale in London. The grinding of watch and optical glass, glass buttons and ornaments, &c., are also branches of glass work akin to flint glass cutting.

Glass "making" only a part of the manufacture.

14. Another kind of division of the manufacture, or rather a cross division, will have to be made more fully hereafter in treating of the nature of the employment, but it is convenient to refer to it here. With a considerable quantity of glass the "making," as it is called, or the work done in a glass house, is only one portion of the manufacture, just as in another manufacture already reported on, viz., Lace, a great amount of labour of an entirely different kind is required for "finishing" the lace after it is what is called "made" on the machine. So in some kinds of glass an entirely distinct class of labour, carried on upon an entirely different system and in workplaces more or less separate, is employed to complete such glass for use, as in polishing and cutting up plates or sheets of glass, and "cutting" or ornamenting flint glass. This distinction between glass "making," or glass house work, and subsequent processes will have to be borne in mind throughout, as it must be frequently referred to under the different headings to be treated of hereafter.

15. Some statistics* furnished as to the above four main branches of the glass manufacture, though relating chiefly to one or two districts only, give some measure of the present importance of the trade as a whole, as well as of its increase within the period referred to. These considerations are of obvious importance with reference to the present or probable future numbers of the young glass workers concerned, as well as to the number and amount of the other interests involved.

Plate glass trade increased.

16. From the date of the removal of the excise duty on glass in the year 1845, the produce of plate glass at one manufactory alone at South Shields, up till that time the largest in the kingdom, had by the year 1863 increased nearly fourfold, viz., from 312,000 to 1,240,000 feet in a year. There are six plate glass manufactories in the kingdom; of these I have visited three, the others being in Lancashire. The three which I visited, and no doubt the others also, are all large establishments.

Crown glass trade declining. Sheet glass trade increased.

17. The manufacture of crown glass has greatly declined, and it is considered "will gradually die out "in this country, as it has already done on the continent;" but that of sheet glass, which serves the same purpose, has far more than proportionately increased. By the year 1863 the produce of sheet glass in two manufactories in one town had become 8,000,000 feet per annum, worth, at a low rate of value, 50,000*l.* The largest of these two alone produces nearly as large a quantity as the six extinct crown glass manufactories on the Tyne, and, as estimated by one of the firm, fivefold what it turned out before the removal of the duty. There are seven sheet or crown and sheet glass manufactories in the kingdom, three large, and four comparatively small, but still works of importance. The two just referred to belong one to each class. Of these, I have visited five, the two others being in Lancashire.

Improvement in flint glass.

18. A leading flint glass manufacturer states that this art has been greatly improved, as no one can have failed to observe, within the last few years by the improved taste of the producer acting on and re-acted on by the taste of the public. This he attributes, in a great measure, to the stimulus given by the late Exhibitions and other means of cultivating the taste, such as schools of design, &c.

Seat of flint glass.

The great seat of the higher class of flint glass making is the Birmingham and Stourbridge district, in which I visited a considerable number of the manufactories.

A new branch, viz., "Pressed" flint glass.

19. In Newcastle-on-Tyne and its neighbourhood, which was another great seat of the blown flint glass manufacture, this has of late greatly declined, to the extent, as stated, of 50 per cent., but the "pressed" flint glass has been immensely developed within the last few years in its place. The annual produce of flint glass on the Tyne and Wear, in which district the "pressed" glass branch of manufacture has its chief seat, though it is in most places carried on to some extent by blown flint glass manufacturers also, was in the year 1863 "estimated by competent authority at 10,000,000 lbs. "weight," of the wholesale value of about 200,000*l.* One firm which formerly produced annually 350,000 lbs. weight of blown flint glass were then making of pressed glass about 3,000,500 lbs. The much cheaper rate at which vastly increased quantities of glass can be produced by means of the press thus brings a useful and elegant article within the reach of a far wider class of consumers. This kind of glass is represented as being constantly brought to a higher state of finish; it also to a great extent renders the manufacturers of it independent of the skilled glass blowers, by whose combinations manufacturers of the blown glass are much fettered, and, indeed, apparently owes much of its rapid development to this circumstance. It, therefore, seems highly probable that this kind of work also will continue to increase largely.

Bottle glass trade increased.

20. The glass bottle manufacture has also increased very greatly of late years, and is still increasing. In the year 1862 the produce of the 47 houses then in operation in the district of the Tyne, the Wear, and the Tees, the chief seat of the common black bottle manufacture, was above 50,000,000 of bottles. There are now 28 bottle houses on the Wear alone, *i.e.*, in and near Sunderland, and probably about 50 in this whole district. The bottle manufacture had increased fourfold since the repeal of the duty in 1845, but other causes, such as the growth of the bitter beer trade, have greatly increased the demand for bottles, especially for export. Yorkshire is another great seat of the bottle trade, especially the pale bottle branch. A village there, Castleford, to which the bottle manufacture was introduced less than 30 years ago, has in consequence, with its immediate neighbourhood, increased from a population of 2,000 to 10,000, an agricultural population being constantly drawn in by the attraction of work for families. There are 23 bottle houses now at work there, and "there is every "reason to suppose (that the trade there) will be very much more extended." (No. 232.) I visited bottle works in the chief districts and some scattered places in England, and also in Scotland, viz., Glasgow and Edinburgh; and in Ireland, the only works which I heard of there being in Dublin.

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* For most of these I am indebted to the kindness of Mr. R. W. Swinburne, of Newcastle-on-Tyne, an eminent glass manufacturer. For further details, see the paper furnished by him, No. 237.—J.E.W.

Q.
Seats how determined.

21. The chief circumstance which seems to determine the seats of the glass manufacture is the neighbourhood of coal, of which very large quantities are necessary, but the facilities for obtaining other materials, such as sand, marl, &c., have also in some cases had an important influence.

22. In speaking of glass house work generally, without mentioning the particular kind, I in most cases do not mean to refer to plate glass houses, in which the work is of entirely a different kind, and men alone, with the exception of a very few boys indeed are employed.

I.—AGE AT WHICH CHILDREN AND YOUNG PERSONS ARE EMPLOYED.

Age of youngest.

23. The age at which the youngest children usually enter glass works is from 9 to 11, but this varies much in different districts and kinds of work. Many go not older than 9. In some cases boys have gone into glass houses younger, in a few as young as 7, but apparently not so young of late as formerly. One, now 14, went into a bottle house, not as a regular worker, but to learn by working under his father about four hours at a time, when "going in sieven." (No. 204.) In flint glass cutting shops boys do not begin younger than 12 or usually 14, except a few who come as mere attendants. In some glass works few if any children are found, and in most the mass now at work are over 10 or 11. At the crown and sheet glass works of the Messrs. Chance, of Birmingham, the largest which I visited or heard of, there is a rule against any boys being employed under the age of 12, and it appears to be strictly enforced, though a very few get in younger. The Messrs. Powell, a leading London firm of flint glass manufacturers, have for many years enforced a rule against employing any under the age of 13. Several other masters have a dislike to boys below those ages, and those who get in younger are taken in out of consideration to their circumstances, or by their fathers or relatives. The average age appears lower in Birmingham than at Stourbridge, where the work is of just the same kind, and most other places. According to the returns of the last census the boys under the age of 15 are one in 7·3 male glass workers of all ages in Warwickshire, against one in 8·5 in Staffordshire, and one in 9·7 in Worcestershire.

Youngest in England.

24. The manager of some Scotch bottle works, who has had a long and wide experience in English glass districts, states his opinion that, in glass work, as in manufactures generally, children are sent to work younger and get to men's work sooner in England than in either of the other two kingdoms, being able to do the work, though not properly old enough for it, "because their parents make them." (No. 202.)

II.—SEX. NUMBERS OF GIRLS AND WOMEN.

Few in glass making.

25. Females are not employed in glass "making," though a few are found engaged in odd ways in connexion with that department. I think it, however, worth while to notice one way in which, in one or two parts of the north of England, including however the chief seat of the black bottle manufacture (Nos. 177, 181 Note), women and girls are employed in glass houses, viz., in "drawing," or taking out bottles from the arches or annealing kilns. The number of these, however, is very small, it being, as it ought, only in a few neighbourhoods that it is the practice to employ females so, and a woman and a girl being sufficient for a house. The only girl under the age of 13 whom I remember finding at this work had been at it four years.

Larger proportion in plate glass works.

26. In plate glass works the "smoothing" of the plates, a part of the polishing process, is done by females, as it is also in a large sheet glass manufactory, where a like process is performed. These four manufactories employ close upon 400 females, about a fifth of them being young persons, and only two children.

Other glass works.

27. Females are also employed in the cutting department of flint glass works, in roughing or obscuring glass for lamp globes, &c., work done by means of steam machinery; also in washing and cleaning glass, wrapping up in warehouses, and in a few other miscellaneous ways in works of all kinds. One of these is painting and enamelling ornamental glass for windows, &c., a superior employment. In some works a woman or two prepare clay for making the pots used for founding the metal. A sufficient account of the number of girls and women engaged in the manufacture will be gathered under the next head.

III.—NUMBER OF CHILDREN AND YOUNG PERSONS EMPLOYED.

Number furnished by returns.

28. Returns which have been furnished to me from forty-five glass manufactories of different kinds and sizes, including the three plate glass works and four of the five crown and sheet glass works not in Lancashire, and twenty-five flint and ten bottle glass works in the chief seats of those manufactures, and one or two miscellaneous kinds of glass work, give the following numbers of children and young persons employed in those works:—

	Children.		Young Persons.	
	Male.	Female.	Male.	Female.
Plate glass - - - - -	59*	—	135*	52*
Crown and sheet glass - - -	112	—	432	16
Flint glass - - - - -	89	1	418	43
Bottle glass - - - - -	109	5	289	29
Stained and other glass - - -	2	1	11	5
	371	7	1,285	145
Total -	378		1,430	

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* The return from one plate-glass manufactory gives only the aggregate numbers of boys under 18, and females over or under 18. The numbers are apportioned by assuming the proportion at given ages to correspond with what is found in the other two like manufactories.—J.E.W.

Q.

Estimated further number.

29. I assume the only sheet glass manufactory from which I have not received a return to employ about the same number of children and young persons as one of the others, with which it is on just about an equal scale in other respects. Other flint glass manufactories which I visited, exclusive of those in London, employ a further number, probably not less than 55 male children and 170 male and 40 female young persons, besides some women. The small flint glass works and cribs in London may probably be roughly estimated to employ as many as 50 boys under the age of 13, and 100 more under that of 18. Besides the above, and the flint glass manufactories in Lancashire, which I excluded from my inquiry, there are some others in different parts as to which I have no data on which to base an estimate, except that the numbers contributed by them would probably be quite small relatively to the numbers in flint glass works as to which I have formed an estimate.

30. The general uniformity in the size of bottle glass houses and the number and class of persons employed in or about each probably allows of forming a fairly approximate estimate of the number of hands employed by a given number of houses by the aid of the returns from a portion of them. I have been informed of the existence of about 86 bottle glass houses now in operation, independently of those as to which I have received returns and of those in Lancashire. A number of these 86 are in works which I have visited. Even as to the works from which I have returns, I do not in all cases know the number of the houses forming the works, but I do as to works comprising from one to nine houses each, or 28 in all. The average number of boys to each of these houses is, as nearly as need be stated, 3·4 children and eight young persons. Taking the same average of boys for each of the other 86 houses, gives 292 children, and 688 young persons. Many bottle works employing no female children or young persons, I add no females, though probably there may be a small number in some of the other works. There may also no doubt be other bottle works of which I have not been informed, besides these in Lancashire, but probably no great number.

Aggregate number.

31. I therefore estimate the aggregate numbers employed in works as to which I have any data, exclusive of Lancashire, as follows:—

ESTIMATED NUMBER OF CHILDREN AND YOUNG PERSONS.

—	Children.		Young Persons.	
	Male.	Female.	Male.	Female.
Plate glass, from returns - - - - - -	59	—	135	52
Crown and sheet glass, from returns - - - - -	112	—	432	16
" " estimate for manufactory visited, but not sending return.	5	—	42	3
Total, crown and sheet glass -	117	—	474	19
Flint glass, from returns - - - - - - -	89	1	418	43
" estimate for other manufactories visited, but not sending returns.	55	—	170	40
" Do. for small works in London - - - -	50	—	100	—
Total, flint glass - - -	194	1	688	83
Bottle glass, from returns - - - - - -	109	5	289	29
" estimate for bottle works not sending returns - -	292	—	688	—
Total, bottle glass - - -	401	5	977	29
Stained and other glass, from returns - - - - -	2	1	11	5
Total, all kinds - - -	773	7	2,285	188

Total of children, male and female - -	-	780
Total of young persons, male and female -	-	2,473
Total of both	-	3,253

Q.
Numbers from census.

32. After working out the above estimate, but not till then, I referred to the tables of the last census of England and Wales. The numbers of persons there returned as engaged in the glass manufacture are as follows:—

—	All Ages.	Under 20 Years.	20 Years and upwards.	5–	10–	15–	20–	25–	30–	40–	45–	60–65.
MALES.												
England and Wales -	13,809	3,954	9,855	55	1,569	2,330	2,102	1,717	—	951	—	293
Lancashire (deduct as excluded from my inquiry).	2,823	865	1,958	8	386	471	—	—	—	—	—	—
In area of my inquiry in England and Wales.	10,986	3,089	7,897	47	1,183	1,859	—	—	—	—	—	—
FEMALES.												
England and Wales -	1,237	500	737	2	98	400	—	—	—	—	—	—
Lancashire (deduct as excluded from my inquiry).	583	282	301	1	52	229	—	—	—	—	—	—
In area of my inquiry in England and Wales.	654	218	436	1	46	171	—	—	—	—	—	—

33. Taking in each case three-fifths as the proportion of those returned as between the ages of 10 and 15, and of 15 and 20 respectively, likely to fall under the ages of 13 and 18 respectively, this gives a total of—

	Children.	Young Persons.
Males - - - -	756	1,588
Females - - - -	28	120
Total - -	784	1,708
Total of both - - -		2,492

Comparison of numbers from both sources.

34. Seeing that all the plate, crown, and sheet glass works, nearly all the flint glass works, and four-fifths of the bottle glass houses of which I have been informed are in England, and deducting, say, 400 children and young persons from my estimate for the proportion in Scotland and Ireland, this leaves a difference of only 361, or allowing for the probable increase of the trade in some branches since the date of the last census, in effect a sufficient agreement, perhaps as close as could have been expected between two estimates arrived at in such different ways. Thus:

My estimate of children and young persons - - -	3,253
Deduct for Scotland and Ireland - - - - - -	400
	2,853
Estimates based on census returns - - - -	2,492
Difference -	361

It will also be observed that the full number of my estimate of children, which I was careful not to make too high, is made up and slightly exceeded by the census numbers for England and Wales, exclusive of Lancashire, thus confirming the remark made elsewhere (b. No. 202, B. 24.) by a witness of wide experience, that it is in England that boys are sent to work the youngest.

IV.—HIRING OF CHILDREN AND YOUNG PERSONS.

Weekly wages and apprenticeship.

35. Boys who have not reached the stage of being actual glass makers or glass cutters, but merely work as helpers, *e.g.* takers in, shovel-holders in sheet glass houses, &c., are paid weekly wages in most cases by the manufacturer, in some by the men under whom they work. When a boy reaches the first stage of learning the trade as footmaker in flint glass houses, or a cutter in a cutting shop, he is "put on" as an apprentice to the manufacturers either legally or practically as such. The apprenticeship in England is till majority, usually for seven years. In Scotland the apprenticeship sometimes is for a shorter period, as it is also in Ireland, and has no reference to attaining the age of 21, or any other age, or not.

36. In one large bottle glass manufactory, on the occasion of a strike, some of the boys were required, as being apprentices, to undertake men's work, though on the boys refusing and being summonsed, the case against them broke down, owing to a legal flaw in the supposed apprenticeship.

Piecework and day wages.

37. Piecework is spoken of as the practice in different machinery departments of some plate glass works, a man being paid for the amount of work turned out in a week in his shed or work-room, and the wages apportioned by him amongst the workers according to their share of the work; but this appears not to extend to the boys. In all the plate glass works boys appear to get regular wages. The girls who smooth usually work as helpers to some woman, and receive such part of the woman's wages as

the latter allows, or, if the woman is her mother, as is often the case, a trifle to spend, such as 1*s.* or 6*d.* Boys or girls who draw bottles from the arches are paid sometimes by the adults whom they help, sometimes by the master. In most other departments the work is day work, and the wages paid by the master.

V. STATE OF PLACE OF WORK.

Temperature of glass houses.

38. It seems commonly supposed by persons who have had but little practical acquaintance with the facts, that glass houses of every kind and in all parts of them are and must necessarily be very hot places of work. This idea requires considerable correction. The amount of air is always very ample, and the general temperature of a house, *i.e.*, that at a little distance from the furnaces, is often very moderate, and in most cases the boys, at any rate, spend a more or less considerable part of their time in these cooler parts of the buildings. In some houses, indeed, even the general temperature is warm, but I have seldom found it oppressively so, except near the furnaces.

39. The heat, however, to which the workers are actually exposed for more or less of their time, depends greatly upon the construction of the houses, the size and relative position of the different furnaces and annealing kilns, the stage of the manufacture which is going on, and still more on the part of the work on which a person is engaged. Where, as I have occasionally noticed, owing to want of space, furnaces and kilns are crowded near together, the heat is reflected back instead of escaping, and is much accumulated, so that boys are constantly in a heated temperature, being, as it were, "between "two fires." Some houses again, especially those in flint and bottle works built with the old construction of cones, have little direct communication with the outer light or air, except through the cone top through which the smoke escapes, and are certainly very hot, especially in hot weather, as well as dark, too dark in most parts to write. Till I had seen many houses, I thought that gloominess and want of light was the rule. A friend who accompanied me to some sheet glass works on a warm day was unable to bear the heat for more than a few minutes. In crown and sheet houses the quantities of metal dealt with at once, and the openings to the furnaces, are much larger than where flint or bottle glass is made.

Draughts.
Smoke.
Dust.

40. In hot houses of all kinds, owing to the heat, the outer air rushes in in strong draughts through doors or other openings, sometimes close to where boys have to work. Sometimes, also, there is a strong smell from the coal, "the sulphur," as it is called, or the air is thick with smoke, which boys say makes them cough. In some also there is a large amount of dust. In the middle of a bottle house I have been repeatedly covered with blacks, which on the chance opening of a door have been blown over me from the heaps of slack or small coal which lie about in such houses. Boys' faces get grimed with this, which, with the perspiration every now and then wiped off by grimy hands, makes an unsightly plaster.

Comfortable glass houses.

41. Many houses, however, such as flint and bottle houses of the newer and cheaper construction, in which the smoke from the furnace goes straight up a chimney, round which the glass house is built like a shed, are not only light, but cool and pleasant. It is due in particular to the Messrs. Sowerby and Neville, of Newcastle-on-Tyne, who have about the largest flint glass works in the kingdom, to state that the favourable comparison as to coolness, airiness, cleanliness, &c., which they make of the state of their own work-place with that of many other glass houses, is only what my experience fully bears out. Large sized openings over the mouth of a furnace have been pointed out to me as of great use in causing a strong current of air and keeping houses cool, and the houses in which I saw them were fresh. Smaller openings are thought to save more heat, but the saving does not seem to be important. (Nos. 153, 158.)

Importance of cleanliness.

42. A small flint glass master states that "the chief thing for health in glass work is to keep the "place quite clean, and have no dust or sulphur about." (No. 134.) The importance of this cleanliness of the work-place, especially with regard to the general practice of taking meals in it, is strikingly illustrated by a medical gentleman, who has known of "one or two narrow escapes from arsenical "poisoning from the food being dropped on the floor when arsenic is put into the pots." (No. 232.)

Arsenic.

Arsenic is one of the ingredients of bottle glass, and is used in large quantities, "about two tons" each week being used in the bottle works of one town and immediate neighbourhood, and "vegetation is "greatly affected," whether from that cause or the sewerage in the river, "and more especially during "the last few years," during which time the trade there has greatly increased. (*Ib.*) Some arsenic is used, but I am not aware to what extent, in glass of other kinds.

Lead in flint glass works.

43. In flint glass, in like manner, lead is an important ingredient to such an extent as to make the mixing of the materials, if done by manual labour, and not, as it is in cases which are represented as very exceptional, by machinery, and unless great care is used, a very unhealthy employment. (Nos. 96, 153, 72.) The materials, which are mixed in the form of powder, are wheeled into the glass house and shovelled through holes in the furnace into the pots. At some large flint glass works, where every care is used in mixing the materials, a manufacturer pointed out to me that his materials were in a damp state, and therefore could not fly about. It may well be that most or all of the noxious fumes from the materials escape upwards to the outer air, as manufacturers have told me that they do. The only complaints which have ever been made to me as to the quality of the air in a glass house are confined to the "sulphur," smoke, and dust. The above remarks are merely to direct attention to the apparent importance of keeping the place clean.

Heat greater in founding.

44. It should also be remarked that the greatest heat, when, if at all, any noxious fumes would seem to be most likely to escape, and when alone in most cases there is much "sulphury" smell or smoke, is during the founding or melting. In all regular factories, the founders, and also the teasers, whose duty it is to keep up the furnaces, are stated to be men, though a "founder's boy" is mentioned in one place. (No. 26.)

Heat different according to work.

45. The main difference, however, of temperature to which a person is exposed depends upon the kind of work and the part of it in which he is engaged. Those who are subjected to the greatest heat

as a rule are only the men who have charge of the metal and furnaces during the preliminary proce of founding or melting before the actual "working," as it is called, or glass making proper begin This heat near the furnace in crown glass works was put at from 300° to 330°. (Children's Employme Commission Report 1842. App. d. 49.) Again, of the glass makers, it is in most cases only the men big boys who have reached some of the upper stages of the work who have their habitual place work near the furnaces. The younger boys are chiefly occupied in passing more or less quickly fro one part of a glass house to another, and thus are seldom more than a few seconds or a minute or tv at a time in the hotter parts.

46. It would be tedious to detail here all the various duties which require a boy to be in a h position. In some work they are almost permanently so, as in crown and sheet glass houses. Th hottest posts, so far as I have observed, are those of pushers in crown glass houses, and of shove holders in sheet glass houses, work done by the youngest boys, but the details of this kind of work fa better under a later head. (B. Nos. 73, 75.) The heat in which the little shovel-holders stand is ve great; at first I could hardly bear to go up and stand in their place. In one case where I tried the he by my thermometer, held in the position of the boy's head, it rose to upwards of 130°. While I w standing near for this purpose my hat, both crown and brim, melted so out of shape that it was un to wear till restored by a hatter. Boys, however, become so accustomed to the heat that they ofte continue standing at their post instead of taking the trouble to move away as they might in the sho intervals in which the work does not require their presence. A manager called a boy away, sayin that he was making his work seem more than it was. In a flint glass house my thermometer at t mouth of the kiln, where the boys put in articles to anneal, standing there, however, each time on while they set down the articles, rose quickly to the top, viz., 150°. At some bottle works a taker-i 11 years old, whom I asked how the hair on his forehead got singed so, as I had noticed it wa answered, "It's the heat of the arch; sometimes it swinges my clothes if the wind draws much (No. 213.)

47. In a necessary part of bottle house work boys and sometimes girls are employed in an atmosphe less highly heated, but probably more objectionable because much closer and less pure. In flint gla houses the articles are drawn gradually towards the cooler end of the kiln, and there finally drawn ou the kilns being made very long and the glass placed in trays for the purpose. But in bottle houses t kilns, when sufficiently cooled down, are emptied by the hand of persons entering them for the purpo These kilns or "arches," as they are called, are ovens, much like large bins in a wine cellar, in whi the bottles are piled as commonly seen in cellars. These are sometimes too hot to be entered, especia if bottles are wanted out quicker than usual for an order; but usually the risk of breakage if t bottles are not sufficiently annealed is a security against the drawing being required or allowed bef the temperature has been cooled to the usual standard, though I was told that this is not ascertain by the thermometer; the length of time which the bottles have been left in is the guide. A man facturer whom I asked what was the heat of one of his arches, supposed "about 70°," but on enteri it I found it to be 106°. Another at other works was 120°. These I judge from the feel to be f specimens. At other bottle works in Dublin, an arch into which I got was so hot and close as to ca difficulty of breathing. Another, in which a boy was, but into which I only put my hand, felt hott A boy had his hand tied up from a burn from handling hot bottles. The gloves which at this ma factory are supplied to the boys for the purpose by the master are "sometimes nearly worn out." (S also the C. E. C. Report of 1842, App. i., Nos. 161, 160.)

48. The arches have no communication with light or air, except the openings, sometimes a do sometimes a mere hole which must be climbed through, through which the bottles are taken o From this cause and from the fire which has been for some time previously burning in the arch to h it, the air no doubt, as I was informed by a medical gentleman that it does, becomes deficient oxygen, and therefore more exhausting to work in.

49. I consider that arches are places altogether unfit for girls to work in, or for young boys at le for more than a very limited period. It is indeed only in some cases that drawing forms more than portion of a day's work. "It would not be at all healthy," "would be quite improper," says t manager of some large works. (No. 183.)

50. The high temperatures described cause perspiration in a person unused to them even at r and naturally in persons who work in them. A statement of the temperature in glass houses given the report of the Sub-commissioner for the Birmingham district under the former Children's Employm Commission, (F. 24, s. 230), is as follows:—

" At the mouth of the furnace - - -	from 172° to 220°
" Place where the blowers stand - - -	" 95° to 118°
" Place where boys " take-in " - - -	" 80° to 196° "

See also the evidence annexed to same report, f. 147, 151, 290. Also, same date, App. d. 48, Q. s. 858.

51. The temperature is not generally found to be oppressive, except in summer; indeed in winte glass house is not unnaturally considered a comfortable place by those who have become used to and thus susceptible of chills in other places. The wife of a working glass master told me that remembers how her husband "used to pray for Monday morning to come that he might go back in " glass house." In winter even glass houses are in some cases very cold. In part of one thermometer "was at 20°, and water froze," and men sometimes work in two or three flann (No. 158.)

52. It is plain that a cool and well-ventilated glass house greatly increases the effective power the workers. The same witness puts the average temperature in which flint glass blowers work, taken at the mean distance between the furnace hole and his seat, at 80°. At 75° a man " " work 8 hours." If it is "from 95° to 100° he is done very soon," and "when you come to work " time at above 100° you feel quite short of breath and uneasy, with a sensation of heat and tremend " thirst." "You cannot sweat, and when that stops you begin to suffer." (*Ib.*)

Q.

Plate glass houses.

53. In only one case did I visit the buildings in which plate glass is cast, scarcely any boys being employed in this department anywhere, three or four at the most in any one place. These buildings are necessarily large and roomy, but owing to the circumstance just mentioned their state is of little importance to the present purpose. I found only one or two young boys in this department.

Wet in grinding and smoothing sheds.

54. The sheds in which boys grind, and those in which women and girls smooth plates or sheets of glass are, in some cases, sloppy from the water used in these processes, the water sometimes standing in puddles, and the dresses getting wetted; but this differs much in different cases according to the care bestowed on the point. The air in one or two places was also noticeably damp and raw from the same cause. It appears that means might without difficulty be taken to keep the feet of the workers from this wet, such as by racks to stand upon, such as I noticed in a room in some Scotch flint glass works in which females wash up glass, and have also seen in the linen wash-house at an admirably conducted orphanage for girls; or by arranging the floor so as to let the water escape, as some Sheffield grinders say is desirable and sometimes done. In one large manufactory I noticed females with high wooden shoes.

Dust in polishing sheds.

55. The places where plates or sheets of glass are polished, as well as the dresses of the workers, are red from the powder used, but this is of a kind to which slight, if any, bad effects are attributed. (No. 22.)

Flint glass, cutting shops.

56. The cutting shops in flint glass works vary much. They are, however, generally light and cheerful, a good light being necessary for the work, which requires close watching. Some are roomy, duly ventilated, and well arranged, but "the temperature is usually high, viz., about 65° (No. 89) and higher probably when gas is lit. Others are choked up with the bands and machinery, always worked by steam; and in some cases so much so that to avoid the bands, which usually slant up from the grinding stones on each side to the roof, it is necessary to stoop in passing. My first impression was that the number and position of these bands in most places must be a source of danger, but this appears not to be the case. A band, however, in a decayed or faulty condition, such as I have noticed, plainly increases the risk of catching in fitting it on, in which there appears to be some risk as with bands used in any kind of work. (Cf. Nos. 94, 65.) See also a case of a boy being killed.—Children's Employment Commission Report, 1842, App. f. 150.

Want of ventilation.

57. Some shops also have not sufficient or any apparent ventilation beyond the windows, and smell close. Ventilation and cleanliness are plainly, as they are universally allowed to be, of great importance in this work owing to the nature of the materials employed. Putty powder, of which lead is a chief ingredient, is used in the two finishing processes, viz., polishing and puttying, to give a smooth surface, and flies off plentifully, more especially when a circular brush has to be used instead of a grinding wheel, and thus impregnates the air. A manufacturer informed me that another more injurious substance would answer the purpose still better, but as far as I am aware it is not used. A certain amount of sharp particles are also thrown off from the glass, which also contains lead, and from the stones or cutting wheels themselves, of which one kind consists of discs containing lead. The cutting, however, is done "wet," as to which see remarks on "wet" and "dry" grinding as observed at Sheffield in the Metal Manufactures of that district. The particles are plainly visible to the eye, and, where several brushes are in use at once, in such quantities that I was told by a glass cutter "you can hardly see down the shop," probably a rather exaggerated expression. The amount thrown off is enough to be worth catching by means of boards placed behind the wheel, and saved to be used again.

No appliances for protection of workers.

58. Appliances, however, for protecting the workers from the particles, further than by general ventilation, are not in general use. A cutter whom I found with a wet sponge over his mouth and nose, and whom his doctor "always tells to give up the work," said that he had found a handkerchief for the same purpose was worse than being without it, and that he had heard from other men that the sponge was "a good thing." I have, however, scarcely ever seen such or any other appliances for the same purpose in use. A flint glass manufacturer of high standing states, "It is impossible entirely "to remove the noxious effects of putty by ventilation or other means, though they may be much "lessened." (No. 89.) The idea of currents of air appears to have been entertained as long ago as 1841. See Report of 1842, App. Q. 860, q. No. 261.

Want of washing places.

59. Owing chiefly to the above causes, flint glass cutting shops are generally regarded both by employers and workmen as much less healthy as work places than glass houses are. Seeing how important scrupulous cleanliness is said by all experienced persons to be in this work, it certainly seems desirable that greater facilities and encouragements for washing than I have anywhere observed should be provided. Water is needed for the work, and stands in numerous tubs and buckets near the workers. This may be and is used for washing, but it is used also for dipping the glass in while grinding, and becomes dirty. A foreman speaking of the attention necessary on this point, states that in his shop "in winter the engine pumps up hot water." (No. 79.)

VI.—Nature of Employment.

Work of boys.

60. The employment of boys in glass houses is so various that it would be tedious, if possible, to give the details. The youngest and most numerous class are not commonly regarded as glass makers at all, but merely as attendants and helpers to those who are so. As to a great part of their work, however, the distinction is unreal in this, as in many other manufactures. The general work of the boys is a saving of time or strength to the men, and is thus in reality as much and as truly a part of the manufacture as the work of the men themselves. If it were not done by the boys it must be, as it sometimes is, done by the glass makers. It is especially in flint and bottle glass houses that the work done by young boys forms an essential part of the system.

"Chairs" or sets in flint glass houses.

61. In all glass houses men and boys work in sets. In flint glass houses the set, or "chair," as it is called, consists usually of four persons, viz., the headman or "workman," the second or "servitor,'

the third or "foot maker," and the fourth or "taker-in." Of these the taker-in is nearly always a boy, and usually under the age of 14 or 15; the foot maker sometimes a boy, and sometimes a man, but nearly always over the age of 14 or 15; the "servitor" is occasionally, but very rarely a boy; and the workman nearly always a man of full age. In some kinds of work the set consists of more hands, and in pressed flint glass work another young boy or two is usually wanted. In inferior kinds of work in smaller places the set consists of fewer persons, say, two men and a boy or even one man and a boy.

"Holes" or sets in bottle glass houses.

62. In bottle glass houses the set or "hole," as it is called from working at the same hole or mouth of the furnace, consists usually of five persons, viz., the bottle maker or finisher, the blower, the gatherer, the putter-up, and the taker-in. Of these the last is a boy of the same age as in flint glass houses, the putter-up a boy rather older, the gatherer a boy or youth, and the two top hands nearly always men. Each furnace has several "holes," or mouths, usually only one to each pot. The common number of pots to each furnace or house is four, in some six.

In other glass houses.

63. In other kinds of houses the proportion of boys is much smaller, and they are more strictly mere helpers. Thus in sheet glass houses a common set is two men and the "boy," and there are odd boys besides. The details of their work will be sufficiently gathered from other parts of the report and evidence.

Takers-in.

64. The chief work of the takers-in, and from which their name is derived, is to carry the articles when made from the glass makers to the annealing kilns, and this must be done at the moment, or the articles would be spoiled. They do also a variety of other odd work, such as cleaning the irons, and waiting on the men.

Putters-up, &c.

65. Putters-up or wetters-off in bottle glass houses, and stickers-up in pressed flint glass work, take an active part in various details of the manipulation of the glass, as do also some of the boys in crown and sheet glass houses. The latter class, however, have no distinctive name, but are called merely "the boy," or "spare boys."

Incomplete sets.

66. When a boy or any others of the members of a set are absent, the set work, as it is called, "short handed," and make up amongst themselves the work of the absentees, doing, if possible, a suitable kind of work, and the diminution in effective power is measured by a scale fixed by the trade. The loss of work occasioned by the absence of a taker-in in flint glass houses is fixed at 14 per cent. (No. 96.) Working short handed is reckoned extremely wasteful to the employer. (Nos. 52, 203, &c.) A boys' work varies much not only in different branches of glass work, but also in different kinds of work in the same branch.

Amount of exertion.

67. In flint and bottle houses, in which the mass of the younger glass house boys are employed, the great feature of their work is the number and frequency of the several small operations which they have to perform, each usually easy and light in itself, and so far justifying the opinion, not unfrequently expressed by employers, that it is not really "work." Apart, however, from the consideration of the heat, and the system of work hours, points noticed elsewhere, these duties in many cases amount in effect not only to "work," but to work causing severe strain on the bodily powers of young boys. The greater part of their time is spent in passing to and fro to take glass to the annealing kilns, carrying and cleaning the men's irons, and in occasionally standing to help the men at their work in various ways, or holding irons with or without glass on at the mouth of a furnace. In crown and sheet glass houses most of the work is of much the same kind, except that there is no "taking-in."

Constant occupation.

68. A boy's attention is constantly taken up, and owing to this, and his almost constant motion, it is almost impossible to speak to him while at his work, at any rate so as to get an answer, so that I often had great difficulty in questioning boys without interrupting their work, and so that of the men; and the others being equally occupied, it was often difficult to find anyone to take a boy's place so as to allow of my speaking to him quietly. Thus I have often had to ask a boy a question in one part of the house, and follow to another for the answer, and perhaps to a third before I could get it, and then only in the presence of other persons. This no doubt was to some extent a check on free communication of facts. Those spoke most freely and gave the least favourable account whom I was able to get apart quietly, or saw away from work. The smaller the articles made, and the rougher the workmanship, the greater is the number of them turned out in a given time, and the greater also the demand upon the boys' exertion.

Great distances travelled.

69. Apart from the other work, the mere distance travelled in a day's work is surprising. It is impossible to state it definitely, as it varies in almost every case with the size of the house, the relative position of the pots or parts of the furnace, and the kilns in use, as well as the kind of work being made; but taking some instances as specimens, it is plain that it often amounts to a great number of miles, and when the distance to be travelled, or the number of things made is great, a boy must almost run, and sometimes does quite.

In bottle glass houses.

70. A gentleman practically acquainted with bottle works in Yorkshire states that the takers-in in them "run upon an average from 15 to 16 miles each journey" or day's work. (No. 232.) At one of these works in which I measured the distance travelled by a boy 11 years old, it amounts, according to the greater or less number of bottles made, to from upwards of 13½ to 17 miles. (No. 190.) In a bottle house in the north of England a boy complains of a "far arch" being 16 yards distant. (No. 184.) Taking this as correct, when the turn for using this arch comes he has to travel to and fro in an average journey, *i.e.*, taking 90 dozen bottles as a fair average (cf. Nos. 177, 180, 187, 210, &c.) nearly 20 miles. If the use of this arch chanced to coincide with a higher number of bottles, the distance might be increased by up to fully 30 per cent, or even more. Though 90 dozen bottles is a fair journey, the actual number when smaller bottles are made is often much higher, running from 100 up to 120 or 130, or even 150. (Nos. 157, 177, 183, 192, 202, 203.) The number depends partly on whether five or six journeys are made in the week, the journeys in the latter case being usually shorter. But in one house "they are now working double journeys (*i.e.*, twice 63 dozen) every day, and six days in the week."

In flint glass houses.

71. Equally long distances are travelled in flint glass houses, but less generally. The longest distances occur when the articles made are small, and the workmanship of a kind which admits of turning them out quickly. Also the working periods are shorter, though more frequent. An intelligent witness, now a small master, speaking of the work in large houses, says, "We used to count sometimes how

" many miles a boy had to walk in a turn. In some kinds of work, such as making common (flint glass) " bottles, it was, I think, as much as 16 miles in the six hours." . . . . (No. 134.) Another, also very intelligent, gives data of much the same kind, viz., 800 or 900 pieces as the number sometimes made in the six hours, and from 30 to 40 yards as a common distance to the kiln and back. In a house of which he speaks it was 40. This would give a taker the distance of (40 × 800=32,000 yards) over 18 miles walk or run in the six hours. (No. 157). Another says, " The distance which a taker-in has to go in a " large place comes to many miles in one turn of six hours. The distance to the kiln is in some (extreme) " cases, I should say, 20 yards, and the same back, and with some work 400 articles will be made in the six " hours." No. 139.) The numbers which they quote are probably extreme cases, given by them to illustrate more forcibly the exertion imposed on boys even in common cases. In a pressed flint glass house in which I took the measures, the distance to the kiln which must be gone by takers-in varies from a very few steps at the shortest up to about 18 yards, or probably on the average 10 or 11 yards; this is doubled in returning. Taking 800 as the average number of pieces made here in a turn of eight hours, and 21 yards as the average distance for each piece, this gives the taker-in 9½ miles in a turn. With 1,400 pieces, which has been known, and the same number of yards for each, the result would be 16 miles, and with the extreme number of yards, 28 miles. (Nos. 144, 145). An event however depending on the average of either pieces or yards being passed, will be unusual just in that proportion, and highly improbable if it depends on a combination of both extremes. Pressed flint glass making is in all cases very rapid. Again, in places in which small glass things are blown, such as medical bottles, the work of the taker-in is very quick. I was told that of the smallest kind, at least 15 gross, or 2,160, are expected in a day, and 18 gross could be made. Taking not more than 12 yards as the distance to and from the kiln each time, taking in 15 gross would require the boy to walk nearly 15 miles in the day. But this number seems larger than could possibly be made in the time by one set of hands, and there is, perhaps, some mistake. It is mentioned also that in some cases two or more pieces are taken in at the same time, but this does not apply to good kinds of glass.

Average distances.

72. The measurements above given are the shortest lines from the place where the glass is finished by the glass maker to the kiln, and do not include windings in and out to avoid other workers or obstacles, or the other short distances which a taker has to move in doing other portions of his work, not easily capable of measurement. Judging from mere eye, without measurement, I should say that the long distances to the kilns mentioned above are some way above the average, and that 15 yards for the double distance is perhaps a common distance; often it is less. The natural effects of going these long distances are referred to hereafter. (B., XIV. Especially B., No. 151.)

Hot work in crown glass houses.

73. The crown houses now at work are very few, and this kind of glass is said to be dying out. The work, however, of some boys still at work in them exposes them to great heat. In one manufactory a boy had been at work since nine years old as "pusher," *i.e.*, in sliding an iron door back over the mouth of a furnace after each piece of glass is drawn out. The disc in being carried away passes so close, within, say, a couple of feet of the boy, shut in a corner of the highly heated brickwork outside the furnace, that he turns his face into the corner to avoid the heat of the glass. Standing much further both from the furnace and the disc as it passed sufficiently cooled to be red only at the edge, I found the heat of it when in front of me very powerful. The boy carries away the pipe when separated from the disc, and returns to the furnace perspiring profusely. This, I was told, is the most severe work in which boys are engaged at these houses, which are large crown and sheet glass works. In some other crown glass works no such pushers are employed, the doors, a supposed improvement, not having been introduced. One crown-house boy, aged 12, a thimble-holder, though at a considerable distance from the furnace, was screening the side of his head from the heat with his hand. (No. 46.)

Boys' work in sheet glass houses.

74. In sheet glass houses, boys, all however necessarily of good size, and over 13, push cylinders into the annealing kilns, work not specially warm, but requiring strength. If, as a manufacturer predicts, foreign competition compels English sheet glass manufacturers to make lighter glass for the sake of saving by employing younger labour (No. 52), this is probably one of the departments in which the age of the workers will be reduced.

Shovel-holders' work hot.

75. Shovel-holders hold the shovel before the mouths of the furnace to screen the face and hands of the gatherers, usually men or big youths, from the heat while gathering the metal. It is not a constant employment, the frequency depending on the number of gatherers working at the pots. It is commonly said that the boys are not wanted to do this till the metal is worked about half-way down, and the gatherers' hands thus approached closer into the hole. I have, however, observed a boy take his place and hold the shovel the minute that a fresh pot was opened and the first gatherer came to it; a boy at another place says that this is the practice (No. 53), as it seems likely to be, the heat even at first being great. There is no exertion in this part of the employment; the point to remark is the great heat, and the young age of the boys. (Nos. 40, 42, 43, 45.)

Putters-up in bottle houses.

76. The "putters up" "stickers up" or "wetters off" of bottles, &c. are also boys, though usually older than the takers-in, being the next stage above them, but are sometimes under the age of 13. Their work requires much care and attention, as without this they are liable to get in the way of the hot metal as it is wielded about by the glass makers. In some bottle houses, in which the "hole" or workplace in which they stand is very confined, it is wonderful how they contrive to keep out of the way at all. In such places a stranger to a glass house cannot get near enough to speak to men at their work with safety, as I have been more than once cautioned.

Other work.

77. Boys perform various other duties, some in and some out of the regular work time. Some go round to the workers' homes to call them when it is time to begin a journey, or clean up in the intervals of work, or after work is over. Other details of employment are, holding a board to screen the hands of a flint glass blower from the heat of the glass at which he is working, if a large piece, radiating much heat, getting ready, cleaning, or holding implements in other sorts of work, preparing "dabby" or clay for arranging the pots properly, or altering the size of the opening of the furnace holes, and so on. The setting of new pots, which happens very frequently in some kinds of work, also finds odd work for boys. Cleaning up the place is another work. In fact the details cannot be described.

Errands for men.

Want of clothing.

78. One of the ways which, though no part of glass work, is not the least valued service rendered by glass house boys, and one which, it is said, would probably cause great opposition on the part of men to any restriction on the work of young boys, is that they act as general "fags," as described by one manufacturer (No. 129), in a way that no others would do. Running out for men's drink is a very common errand. These errands, however, when they take boys out long distances in cold weather, when "sweaty" and with "only shirt and trousers on" (No. 69), or if "the men won't let you stop for "that (*i.e.*, to slip a waistcoat on)" (No. 73),—it may be in a winter midnight,—amount to unpleasant work, and are apt to cause colds. Many boys are very poorly off for clothes. With work causing so much perspiration the want of proper change is a special disadvantage. "In summer it's awful" (*i.e.* the heat). "Wear the same shirt all through the week, and sleep in it." (Nos. 90, 193.) The feet suffer from this cause. (No. 134.) See also No. 203, *ad fin.*

Weights carried.

79. Though in many parts of boys' glass house work the bodily exertion, apart from the quickness of motion and the distances travelled, is very slight, this is not so in all cases. The weight of each article taken in by boys, though small in itself, is practically much heavier from being held at the end of a fork several or many feet long. A taker-in of flint glass complains that heavy pieces, as of 1½ or 3 lbs., make him out of breath, and speaks of his refusing heavy work. "3 lbs. at the end of a long stick,—so "long, (about 7 feet), is awful." (No. 86.) The weight of a common quart bottle is about 1 lb. 9 oz., or 19 lb. to the dozen. In a fair journey 90 dozen are taken in by a boy, making (19 lbs. × 90) more than 15 cwt., or in some fuller journeys about a ton, carried at the end of very long forks, for the distances above mentioned, though only a small weight at each time.

Blowing.

80. The pipes carried in crown and sheet houses are also heavy, some weighing 16 lbs. or 20 lbs., and boys sometimes carrying two of the latter weight at once. (Nos. 23, 47.) They are heavier from their great length, which requires them to be grasped near the heavier and hot end, on which account I have seen a piece of thick woollen cloth used to protect the hand. A sheet glass house "spare boy," whom I found carrying cylinders of glass, each weighing 19 lbs., two at a time, had to carry 200 some distance out into a separate building.

81. Boys seldom get to any regular blowing work before the age of from 14 to 16, even in the lighter kinds of glass. Young boys, however, who work with fathers or men well disposed to help them on in the trade, are constantly getting their hand in by handling the men's tools and trying to make things in spare times, such as the stoppages for meals. This is the way in which they are able first to show their capabilities, and learn the work enough to be put on. "Blowing behind" also was explained to me to be part of boys' work in a crown glass manufactory, and also in making large bottles or carboys, and to consist in performing the first process of enlarging the glass by blowing. This relieves the adult blower of part of the labour which becomes much heavier with the larger masses of glass.

Plate glass grinding, smoothing, and polishing.

82. Boys who grind or polish plates or sheets of glass stand watching the machinery, and throwing on sand or red polishing powder as often as necessary. Grinding lighthouse glass is a work of the same nature. There is no further exertion. The rouge or red powder reddens the face, hair, and entire dress, so that in one neighbourhood the boys were spoken of to me as the "red boys." From this cause half-time, otherwise than by working alternate days, would probably not be found suitable. Smoothers also commonly stand watching machinery, or rubbing with the hand. The rubbing is fatiguing work for girls, and the wet slops the dress unless they are properly protected and care is used.

Flint glass cutting.

83. Flint glass cutting is sedentary work, requiring a fixed leaning posture and close watching with the eyes, with a constant grasp of the glass to hold it properly against the cutting wheel. There are several processes,—roughing, smoothing, polishing, and puttying. The two latter, as already noticed, require the application of putty powder, and are part of the work done by boys. A cutter sometimes applies the putty with a small bundle of straw held in one hand, but in some cases a man's work is of a kind which requires him to have a boy to feed the wheel with putty for him. Boys thus get putty on their hands and splashes of it on their face and clothes, and in feeding for a man I have seen a boy's naked arm so dabbled with the putty mixture as to be literally covered with it up to the elbow, the shirt-sleeve being turned up to the top to keep it out of the way. The amount of putty thrown off is greatest in finely cut patterns, in which a revolving brush must be used instead of a wheel. Attention to cleanliness, and the state of the hands and nails underneath and at the roots, is of great importance. (No. 79.) Roughing glass, such as lamp globes, done by females at steam machinery with a handful of wire and wet sand, is work of the same kind, and very dirty, but not otherwise objectionable.

Other work out of glass houses.

84. In most works there is miscellaneous day work done in the yard or warehouses, *e.g.*, getting in coal and materials, carpentery for packing cases, examining, sorting, and packing glass, cutting up plates or sheets by hand, washing dirty glass, sorting and picking out waste glass or fuel for use, cleaning moulds, &c. These vary according to the kind and size of the works. In some small places an odd boy or girl is taken in perhaps only now and then, or for part of a day for the purpose of thus picking waste glass or fuel.

Brass foundry.

Pot making.

85. In rare cases a brass foundry department, in which the employment is of the kind usual in brass foundries, is found, as supplementary to flint glass work requiring such fittings. Many manufacturers make their own pots, the quality of which is of vital importance to them, and in these cases a few females and boys are employed in carrying or preparing clay. This work is of a kind which would seem to come under the Factories Extension Act, 1864, which includes crucibles.

Stained glass work.

86. Much of the employment in stained glass manufactories, so far as I have seen or was informed, is of a higher and artistic kind, performed by a superior class of persons, none being children and but few females or young persons, and consisting in drawing designs or paintings, or painting them on glass. Other part of the work consists of burning in the colours at furnaces, work done by men, and cutting out glass and fitting it together, and soldering in lead work frames, called glazing, in which I saw a few boys employed. Under the circumstances, I made but very slight inquiry into this branch of manufacture. The manufactories of Mr. Wailes, at Newcastle-on-Tyne, and that of Messrs. Powell, of London, both well-known names, both of which I visited, probably afford fair specimens of this branch of art.

Silvering mirrors.

Barometer making.

87. Silvering mirrors seems to fall properly under the head of glass manufacture, but I found it carried on in only one of the manufactories which I visited, viz., the plate glass works at Newcastle-on-Tyne. Only a few men and women were employed, the latter cleaning glass for the men. There are several establishments in London, and some work is said to be done on a small scale in dwelling-houses. The employment is considered of a nature requiring great attention to ventilation and cleanliness. (No. 2.) See generally as to this and barometer making in the Sixth Report of the Medical Officer of the Privy Council, and Appendix, pp. 21–23, 359, 360, which shows that the work is very unhealthy without such care. But the persons engaged appear to be very seldom of the class falling within the scope of this inquiry. One of the largest establishments employs apparently only "one" boy in silvering. (*Ib.*, p. 359.)

VII. Hours of Work.

Peculiar systems of hours in glass houses.

88. The hours of work in glass houses of most kinds are very peculiar and varied, more so, probably, than in any other manufacture. They are, however, mainly governed by one common principle, viz., the length of time which it takes to prepare and work out the given quantity of metal which it is found expedient or practicable to manufacture at one time. Whatever amount of metal is prepared must be at once worked out, or nearly so, with only such slight interruption as may be absolutely necessary; otherwise loss of different kinds would be incurred. If the pots are large, and contain large quantities of metal, the process of founding is long, varying with the nature of the fuel, furnace, and material used; and if the metal is worked out, not in large masses at a time, as in plate, crown, and sheet glass works, or in smaller, but with very rapid execution, as in bottle glass works, but both in small quantities and with slower execution, owing to the large proportion of highly skilled manipulation required for each article, as in most blown flint glass work, the time of working out is lengthened in proportion. Only a limited number of glass makers can work properly at the same part of a furnace.

89. The term "manufacture," as used above, is limited by me to the production of glass in its original rough shape at the glass-making furnaces from the time of beginning to put in the raw materials till the time that they are sufficiently worked out, and the furnace left to be got ready to receive another set of materials, and does not include any preliminary or subsequent operations not dependent on the principal glass-making furnaces.

Number of working periods in a week.

90. In plate glass houses this act of production can be completed quickly enough to be repeated in fairly uniform periods daily; but in other kinds, except some bottle houses and the small flint glass works, it is longer by a greater or less number of hours. In crown and sheet glass houses it takes about 42 hours (Nos. 44, 49), and thus can be repeated only four times in the week. In bottle glass houses the length of time is less uniform, ranging from towards 30 hours in some to little over 24 in others, so that the act is repeated either six or five times accordingly. In flint glass houses, with the usual large furnaces, it takes nearly the whole week, and thus of course can be performed only once. The working out of the pots, except in the larger flint glass houses, is begun and completed by one set of hands at one time, not being long enough to require or admit of a relay. In some cases the pots are replenished in the course of working them out, but this is said not to be suitable for the best kind of work.

Varied hours at which they occur. Crown, sheet and bottle glass journeys.

91. Sunday secures usually ample time for the preparation of the metal, and in crown, sheet, and bottle glass houses the first working process or "journey" usually begins as soon as that day is ended, *i.e.*, at midnight, or within two or three hours after it, so as to allow as much margin as possible for accidental delays which constantly arise, in order that the full week's work may be finished before the week is out. In sheet glass works, at one place, the boys come at 9 p.m. on Sundays. (No. 42.) These working journeys take in sheet glass houses from 8 or 9 to 10 or 11 hours; in crown houses, an hour or two longer; and in bottle houses from 9 or 10 to 11 or 12, or in some cases more, *e.g.*, up to 14 or 15 hours. "Sometimes 14 or 15 hours." (No. 199). "14 or even 15 hours." (No. 203.) &c. Hence these journeys fall in either the day or the night, or, more often, partly in both, just as it happens, beginning after Monday at no definite hour, but just when the metal happens to be ready for working. Most of the remainder of the time is spent in the preparatory process, including filling in the metal, founding, and settling.

Founding.

92. The length of this process varies, but its average length is shown by what is above stated. Speaking roughly, it takes on the average in crown and sheet houses from 28 to 32 hours, in bottle glass houses from 14 to 18 hours, and in regular flint glass houses is performed between Friday or Saturday, and Monday, sometimes Tuesday. When six bottle house journeys are made in a week both the founding and the working process are shorter than with five, and things being favourable, the founding can be done under 12 hours.

Differences in the same manufactory.

93. It may be well to remark here that as regards hours, as in some other respects, each glass house, or rather each principal furnace, for some houses have more than one such furnace, is independent and complete in itself, as if it were a separate manufactory. In some cases one house does form the whole manufactory, but often there are several on the same premises, and sometimes others belonging to the same employer in other premises.

Accidental delays.

94. It is said to be impossible to secure any regularity, but generally speaking accidental delays are diminished, time saved, and uniformity approached just in proportion as the whole establishment is in good working order, *i.e.*, the furnaces, pots, fuel, and materials good, the hands steady and attentive, and the management efficient. On the other hand, neglect or defects anywhere are liable to hinder the work, and these may occur in so many details that it is said to be impossible to guard against them all, and often to discover where the fault lay, or at any rate in time to remedy it.

End of last journey.

95. The working, however, almost always ceases some time on Saturday, if not some time in the night before. Bottle makers in many places will not now work after 4 p.m. on Saturday, formerly they would work till 10 p.m. or later. Sheet glass makers usually finish by the Saturday evening, or before. In both crown and sheet and in bottle glass works, in occasional instances, work is continued up till midnight on Saturday, but scarcely ever into Sunday. (No. 49, 52, 185).

System in blown flint glass houses: Six-hour relays.

96. In all blown flint glass houses of any size throughout the United Kingdom there is a uniform system of work by two sets of glass makers working alternately in relays or "turns" of six hours each, day and night, from the time of beginning to work the metal till the time that it is worked out, this taking

as long a time that relays are necessary. This takes on the average four days and four nights, usually beginning at 6 or 7 a.m. on Monday. Sometimes it ends rather sooner, or begins or ends, or both, as much as half a day or a later, but the same set of hands always work in the corresponding periods of the 24 hours, thus having equal quantities of day and night work. Five days and nights is a long week, and not often made. I am informed by the manager of some leading works that with improved furnaces and good arrangements this standard may, he hopes, in time be reached, but that the working period will never come to exceed this amount.

In pressed flint glass houses: Eight-hour relays.

97. In pressed flint glass houses in the north of England the two sets of glass makers work in relays in the same way, but the turn is eight hours instead of six. There is also a break of about two turns in the middle of the week to refill the pots. The first turn begins at 5 a.m. on Monday, the second at 1 p.m., the first comes on again at 9 p.m. and works till 5 a.m., and so on, the turns changing weekly so as to divide the nightwork. This system was first introduced by Messrs. Sowerby and Neville about 12 years ago to avoid the inconvenience of a change of hands at midnight, and to save time by diminishing the number of changes, and this system has become general in that branch of trade. A small blown flint glass manufacturer in the same town has also adopted it, and much prefers it, as it allows of occasional full night's sleep.

In small works: Twelve-hour relays.

98. In flint glass works employing very small numbers of hands where the furnaces and pots are small, and common work made, a third system prevails, viz., the same set of glass makers work for 12 hours at a time. In most cases there are day and night relays, who change weekly, but in some very small places the glass makers work by day only, the pots being filled and the metal melted during the night. It is said by regular flint glass manufacturers that this system would not be possible in large works, and where flint glass of the superior kind is made, one reason being that the metal could not be got sufficiently fine without the larger furnaces and pots. In these small places work goes on in some for five, in others for six days and nights, or in some, in such a poor way of business as not to have regular work, only as the business requires. At one, work went on six nights and often seven, *i.e.*, stopping at 7 a.m. on Sunday, and beginning again at 7 p.m. (No. 133,) and once going on in the day of Sunday as well.

Six-hour relays considered.

99. This arrangement of six-hour turns has been the custom in the blown flint glass trade in this kingdom for generations, and is said to have originated probably in the inability of the men, owing to the heat, to continue the work for a period of 12 hours. It is however less heavy than other work, such as iron puddling, in which 12-hour turns are the rule, and other kinds of glass work, which, as shown above, men continue for periods of from eight or nine to 12 hours. Those who have worked in the six-hour as well as the eight or 12-hour turns concur in saying that they like the longer turn the best, as it gives them longer times unbroken for rest, and more of night sleep. (Nos. 158, 134, 130, 139, 140.) Allowance must be made for men being prejudiced in favour of their own practice, and inclined to speak well of it; but those who began with a prejudice against it have found reason to alter their minds. The length of sleep is obviously a matter of more importance to boys than men. It is true that in blown flint glass houses more delicate workmanship is required than in some of the other works referred to, or in the pressed flint glass, in which the eight-hour turns have been adopted.

Its bearing on boys.

100. It is however unfortunate for the boys. During the working part of the week six hours is the utmost unbroken period ever attained at any one time for rest, and out of this has to come the time spent in coming and going to and from work, washing, dressing, and meals, leaving a very short period indeed for rest, and none for fresh air and play, unless at the expense of the sleep necessary for young boys, especially at such hot and fatiguing work. If the usual week were extended to the five days, contemplated as possible (B., No. 96), this would take away some of the time which the boys now have for rest and play at the end of week, while it increased their labour. Even the short sleep is obviously liable to be broken by a boy having to wake himself, if it is night, or by the noise if it is day. (Nos. 120, 207.)

Boys work longer than men.

101. In most crown, sheet, and bottle glass houses the younger boys come, more or less considerably before the men, generally by as much as from one to two or three hours, to get things ready for them, and they also stay a short time, from a few minutes to half an hour, after the men leave, to clear up. This makes the period of boys' work to that extent longer than the time spoken of as the average length of journeys, so that in few cases is the boys' work much under 12 hours, and it is often 13 or 14, and in some cases 15. "On the average we are here 13 or 14 hours." (No. 184, &c.) The time is longest in crown houses and in bottle houses making only five journeys a week. In one crown glass manufactory the men are limited to 12 hours for making the amount of work required of them (No. 47), and in a bottle glass manufactory to 11½ hours. (Nos. 192, 195.) In flint glass houses also boys sometimes come half an hour before the men, to get things ready.

This unnecessary.

102. Whatever might be the difficulties occasioned by restricting the work of boys in the actual glass making, it appears that they would be slight if only this excess of the boys' work over the men's were cut off. The manager of a sheet glass house in one of the largest manufactories states that the boys generally come three hours before the men, but that they might do all that they have to do in half an hour. They came so soon "merely because it is the practice." (No. 48.) There is nothing in what they do which could not be done equally well by men. The same remarks would apply equally to other sheet and to crown and bottle glass houses.

Summary of hours.

103. The above account gives an idea of the regular proper length of boys' work in glass houses, as nearly as it admits of being stated definitely. It may be stated roughly, as varying with the branch of work, from 48 to 60 hours a week, and in some cases, either habitually or exceptionally, more or less, giving a wider range of from 40 to 70 hours. The return from a bottle glass manufactory in Scotland states, that "The hands usually work 14 hours five times a week." These numbers include the stoppages for meals or other purposes. Owing, however, to the irregularity of the system, except in flint glass houses, it is impossible to give an entirely accurate statement. Details must be filled up from the specimens given by the witnesses in their statements.

Q.
Nominal and actual weeks: In flint glass houses.

104. The glass house week, however, is counted not by the number of hours, but by the amount of work done, a certain amount being required of each set of hands. In flint and bottle glass houses the week actually made and expected to be made is considerably in excess of the nominal week, often by nearly 50 per cent. or more. Thus in regular flint glass houses the stated week consists of 11 "moves" or portions of work, and the men's rules do not allow more than one move to be made in three hours. Hence the nominal week's work is 33 hours, and a fair actual week's work about 48 hours, it may be more. What is made over the 11 moves is paid for as overwork. The rule limiting the amount of work which may be made in a move, though meant by the men for their own protection, seems undoubtedly injurious to the trade and to them, as it checks individual effort and excellence. A flint glass maker, wishing to show how much more than the allowed amount could be made in a given time, produced 200 small articles in the time for which 72 was the fixed standard, but, as I was informed, he nearly lost his life in consequence,from the indignation of other men in his trade.

In bottle glass houses.

105. In bottle glass work the week, as already stated, consists of a given number of journeys, and a given number of bottles, usually about 63 dozen, is required to be made in a journey. But as a fact the number made is much greater, usually by nearly 50 per cent., sometimes double or more. The fact that men wish to have this overwork, as more advantageous to them, is mentioned as a reason why they would not like to have six journeys instead of five. This, however, is a mere accidental arrangement, and could of course easily be altered. Indeed it seems that in some bottle works where six journeys are made, the sixth journey is paid for as overwork.

Work beyond these limits.

In place of other boys.

106. The work of individual boys, however, is often in flint glass houses, and sometimes in crown, sheet, or bottle glass houses, actually much in excess of the supposed length of their proper hours. In the latter three kinds of house, the pots are worked out as far as is thought desirable, and have to be refilled at once, so that a boy cannot work beyond his usual amount, unless there are two or more houses in the same manufactory. But as the times of these houses being at work are liable to fall more or less apart, and are said to be seldom quite together, and, indeed, at one place to be purposely so arranged that "as "near as may be work shall begin in one when it ends in the other," a boy may be taken from one house to supply the place of a boy wanted in another, and it appears that this is occasionally done, and a boy has thus gone six journeys in a week, in works where there are several sheet glass houses. (No. 53.) So has another where there are only two houses, and "a good many of the other boys work over too." (No. 42. Cf. also Nos. 41, 183.) So in a kiln in which cylinders of sheet glass are flattened, a boy has worked over for part or all of the 12 hours in place of a boy in the other turn, and has thus worked 36 hours together. (No. 54.) A boy, 12 years old, who works as "drawer" in very large bottle works, from 5 or 6 a.m. till 6 p.m., had to "take in," in place of a boy who was away, till 2 a.m., and then slept in the furnace till 5 a.m., when his next day's work began. (No. 193.)

Or in other ways.

107. Apart from these ways boys may also be occasionally kept a longer time than usual in the works by accidental delays arising after they have been called to work. In this way a boy has been kept in large bottle works, though lying down to sleep part of the time, "twice for 20 hours, and "once for 24 hours, without leaving." (No. 184.)

Excessive over work in flint glass houses. Arises from relay system.

108. These cases, however, from their nature are probably rare. But in flint glass works, in which the working of the metal goes on uninterruptedly, and boys are wanted either to supply the place of boys who happen to be away, or when a kind of work which requires extra boys happens to be done, such as press work, the length of time for which some have to work is wonderful. The remarks made in my report on the Metal Manufactures of the Sheffield district as to the unavoidable opening given to this where boys work in night relays at all (see that Report B., No. 73, 76) apply equally to this manufacture.

How far voluntary.

109. In theory the boy only stays from his own choice, and some who are more spirited and more independent in their circumstances actually do refuse. I have found rare cases of boys who have answered proudly that they never have worked over, and would not choose to do it. The fact, however, that the absence of a boy will throw out the work of the chair or set of men and displease them, and that working over thus will give the boy an opportunity of getting a little money for himself,—the only money, with the exception of a few pence usually allowed by parents out of the regular wages which he is allowed as a rule so to keep,—is in most cases a strong enough inducement to secure boys being found to work over when wanted. The term "working over" is applied not to work in excess of the nominal week, which is expected to be and is usually so made to a greater or less extent, but only in work in an intermediate turn.

Cases of excessive over work: With six-hour turns.

110. A single turn "over," on the system above described, involves 18 hours consecutive work, followed only by six hours rest for sleep and meals, and this subject to the other deductions noticed above (B., No. 100). One or more turns "over" are often made by a boy in a week, frequently three, sometimes more. A boy who has himself worked in this way 36 hours without going to bed, speaks of another who would work for 60 consecutive hours; "come on a Monday morning, say, and work straight on to "Wednesday night without going to bed." (No. 69.) Another has worked eight turns "over" in a week, which cannot imply less than 120 hours consecutive work, less two intervals of six hours each for rest. (No. 73, and note.) Another has sometimes worked five turns "over" in a week, implying a length of working hours, with a deficiency in periods of rest, much less extreme, indeed, but still startling. (No. 75.) Another has "worked as many as seven turns running, and five turns running, often." (No. 74.)

With twelve-hour turns.

111. In the small flint glass houses, working the 12-hour turns, a single turn "over" entails, of course, double the amount of work which it does in the six-hour turn houses, viz., 36 hours, and this is not unfrequently done. A man, now 36, who began the trade at eight years old, says, "Many a time, "even while I was a boy, I have been on 48 hours at a time in these small places till I could hardly "hold my eyes open, and I have been that way so as I couldn't sleep, because I was over tired. I was "forced to do it." (No. 130.) A boy, when about 12 years old, worked five such turns or 60 hours running, with a break of six hours, *i.e.*, from 7 on Saturday morning till 7 on Monday evening, making glass on the Sunday (not minding a furnace), except from 1 to 7 p.m., when he was fetched back just as he was

getting to bed, a bigger boy having run home. On the faith of his expected Sunday night's sleep he had spent this interval in playing instead of rest. "Didn't like it at all. Was so tired I could scarcely "stand up." (No. 133.) Another says, "Have worked 36 hours together, *i.e.*, one turn over, but "never more at any one time. May do it twice in one week, perhaps." (No. 131.) A boy, 10 years old, has worked from 7 Friday morning till 7 Saturday evening. "Lay down a little on anything I "could;" and at a former place often worked half-turns over, making from 7 a.m. till 1 a.m. following, sometimes three times a week. (No. 138.) In all these cases of long hours it is important to bear in mind the amount of exertion noticed above as often required.

Boys in charge of furnaces. Sunday work.

112. In some of these small flint glass works in London, boys "stoke" or take charge of the furnaces, with or without other work, for turns of 12 hours. At one place a boy had to do this, besides his week's taking in, on alternate Sundays, and two or three times on successive Sundays; another boy, taking the alternate Sundays. "Got 1*s.* for it, and all my grub." Another does it for seven nights, another for six. (Nos. 130, 131, 133, 136.)

Boys in sheet glass flattening kilns.

113. The pushers in sheet glass flattening kilns likewise work in turns of 12 hours, changing night and day work occasionally. In one manufactory their work begins at 12 on Sunday night, and with usually a break on Wednesday night, ends at 12 on Saturday night. (No. 52.)

Drawers. Hours vary.

114. The hours of "drawers" in bottle houses vary. In some cases a larger number work only a few hours, *e.g.*, from two to six hours, in a day at it, doing nothing else, or combining it with other work, *e.g.*, before the bottle making begins, or in breakfast time (Nos. 183, 200, 206.) In some it forms the constant employment of a few. (Nos. 185, 193, 214.) It is usually day work, beginning at about 6 a.m. but in one case at least the drawers come on at the same time as the bottle-making hands, whenever the journey may be. (No. 210.) This appears unnecessary.

Hours out of glass houses.
Overtime at plate glass machinery.

115. In all other departments of glass work from 6 a.m. till 6 p.m. is the usual day. What excess there is calls for no special remark, except in plate and sheet glass grinding and polishing. In these the overtime is serious, not from being extreme on any one day, but from the length of time over which it is continued, which is such as to make the overtime appear the rule rather than the exception. I have understood, indeed, that there is or was a rule of the trade limiting the work to a certain number of hours in the week, but I did not learn this at any of the manufactories which I visited, and the limit, if it exists, must either be rather wide, or not very strictly observed. All the manufactories in which I found this work give evidence in one or more departments of at least 14 hours' work daily, in some cases 15, and at one place 16, and this not occasionally, but continued for at least several months. At one factory a polisher, 12 years old, has worked from 6 a.m. till 9 p.m., ever since he last came, *i.e.*, six months, and the previous winter for several months he and all the other polisher lads worked for several months from 6 a.m. till 10 p.m.; one of the boys working these 15 hours daily is only 10 years old, and a grinder, 11 years old, has worked 14 hours daily for the six months that he has been there. (Nos. 3–6.) At a second, the hours are about an hour shorter; the statements as to this covering about 18 months. But the smoothers, women and girls, one 12 years old, work from 6 a.m., or as soon after as they like to come, till 8 p.m., and have done so for nearly two years. (Nos. 8–12, 14.) A boy, now 14, five years' polisher at a third factory, says, "The hours "were from 6 till 6, but nearly always in winter, as long as the cold weather lasted, we worked over till "9 p.m. (No. 17.) This coincidence of late work with cold weather may, perhaps, receive some light from the remark in No. 2, that "a warm temperature is required, and it is found that work goes on "more quickly and better at the end of the day owing to the increased warmth." A boy, nine months a polisher in sheet glass works, the remaining factory, gives his hours as from 6 a.m. till 8 p.m., except Monday and Saturday. (No. 33.) The machinery runs the whole time, stopping only occasionally for oiling it and for relaying benches with fresh glass. This relaying of one bench, however, as I have seen it done, does not involve the stoppage of work at the other benches. But I was told by a manager that these unavoidable stoppages insure ample intervals for meals and rest. A member of one of the firms, in whose factory overtime prevails as a rule, at least of late, expresses his confidence that "when "we have more perfect machinery, as we shall have shortly, we shall be able to do without it," *i.e.*, working longer than from 6 a.m. till 6 p.m., which he has a strong opinion are the right hours of labour on moral grounds. (No. 2.)

VIII. Night Work.

Common to nearly all glass houses.

116. A pretty complete account of the night work usual in glass houses is necessarily involved in the foregoing account of the general system of hours. It shows that night work of boys prevails more or less in all glass houses. Plate glass houses may be disregarded, the boys in many of them being so few that they cannot be essential to the manufacture. Of others it is shown that in flint glass houses night work for six, eight, or 12 hours is almost universal, and that in crown, sheet, and bottle glass making the amount of night work is altogether uncertain, except in the sheet glass flattening kilns, on which the night work is for 12 hours. The necessity for it reaches its minimum in bottle glass houses performing six journeys weekly. The idea of doing away with night-work in flint-glass houses has been entertained, but seems scarcely to be practicable, in works of any size. (Nos. 56, 57, 113, 157.)

Some boys always kept on night turns.

117. It only remains to remark that in some of the small flint glass works, in which the 12-hour day and night turns prevail, some boys are kept permanently in the night turn, without the usual change to day work, to suit the convenience of masters or men who prefer to have certain boys by day working with them. (Nos. 133, 138.)

Exceptional out of glass houses.

118. In subsequent processes of glass work night work is not customary. In the plate glass works it has at times been tried in the polishing department, but in two at least of the three it is now avoided, if possible. "It does not answer. The machinery will not stand it properly;" besides objections to the practice itself. (Nos. 2, 8, 17.)

IX. Meal Hours.

Q.

Stoppages, but not stated. Flint glass houses.

119. In glass houses there are no stated meal-times, but as a fact one or more meals are taken during the working period, according to its length, in the intervals of work. Such intervals are needed for replenishing the furnaces, except apparently in the larger flint glass houses. In these it is customary to stop for about half an hour in the middle of the turn. But in some large pressed flint glass works "it is necessary to keep the work partially going in this interval to prevent the "moulds from getting cold." (No. 153.) A boy says "Stop to eat and start again, just as soon as you "get it like." (No. 154.) In the small flint glass works, with 12-hour turns, about an hour and a half are taken for meals.

Crown and sheet glass houses.

120. In crown and sheet glass houses a stoppage of about the same length, in some cases more or less, is spoken of, but in crown houses it is apparently less than in sheet houses, as one firm states, "about "half the time, and sometimes they prefer to go on without stopping at all or scarcely stopping. It "is as the head man requires." (No. 49.) The manager of a crown house in other works stated that "there is one stoppage, such as that just now (scarcely noticeable, J. E. W.) when the fire is attended "to, but it is not more than about five minutes." (No. 23.) But a boy, speaking of one house in the same works, says, that he had usually half-an-hour. Some reasons furnished from the nature of the work by one firm may account for the stoppages taken in crown glass houses being shorter than in others. (No. 49.) Some boys, however, say that they have no stop for meals. Thus in sheet glas works, in which the meals had been described in the Tabular Return as "optional," boys say "they "don't let us stop at all in all the time; we eat, but we has to work." (No. 42.) "Sometimes get a "minute or two, sometimes only a second; get a mouthful, have to run back to work, then, perhaps, "get a second or so again." (No. 43.) So, "Have not had a regular stop for a meal since I came this "morning (*i.e.*, at 10·30). Have sat down about half an hour altogether," *i.e.*, by 5 p.m. (No. 45.) So in a crown house, "Don't stop work for them," (three meals had that day,) "carry a pipe, then eat a "bit, and so on." (No. 46.) A manager says, "The men lie out by turns, but they do not give a boy "the same privilege. The boys, however, have plenty of time to eat." (No. 47.)

Bottle glass houses.

121. In bottle glass houses, &c., from one to three stops, commonly two, in some cases of 45 minutes, or from that down to 20, or a little less, seem usual; but one boy cannot tell how long he stops, "we keep no time. Don't all stop together, but go by turns." (No. 200.)

Work in meal-times.

122. What stoppages there are in any kind of glass house are not always clear rest for boys, but they are liable to odd duties in them, such as in one case drawing the arches, in others sweeping up, &c., and in work which admits of it boys take advantage of these intervals to handle the irons or try blowing glass, so as to fit themselves to learn glass making.

Meals in work place objectionable.

123. The meals are taken in the glass houses, a practice which, to judge from the statement of a medical gentleman (No. 232), is liable to some risk. The practice also keeps them within call for any service which may be required of them by the men, and ready to begin regular work again the moment that the glass makers and the furnaces are ready. It is no doubt on account of this, as well as of the short times often taken, that it is considered that boys must take their meals on the spot.

Objections to stated meal-times.

124. The chief loss spoken of as likely to arise from compulsory fixed stoppages for meals is the diminution of the amount of working time to that extent, which, if the work were rather behindhand from delays, might possibly cut off a portion of a working period at the end of the week, though scarcely so in flint glass houses. (Nos. 49, 180.) A difficulty, not apparently insuperable by care, might be occasioned in crown glass houses (No. 49), and another difficulty, which also might apparently be got round, as by keeping the moulds warm in some other way, is referred to in pressed flint glass works. (No. 153.)

Allowance for meal-times necessary.

125. A certain amount of heat beyond what is usual at present might also be going to waste, but it seems likely, not equal in money value to the waste of animal power now going in glass houses throughout the kingdom from growing boys not having enough quiet time to eat their meals at their ease, with a little rest afterwards for digestion. Anyhow it cannot be doubted that glass house boys, undergoing such labour as many of them do, for their own well-being imperatively require more or longer intervals in the course of their work than many get. Glass house work requires a great amount of support. (Nos. 26, 59, 183, 180, 203.)

A difficulty in stated meal hours.

126. It is not unimportant to call attention to the fact that in glass houses working by journeys, which are constantly shifting their position in the 24 hours, the meals taken in corresponding portions of the journeys, as well as the sleep which precedes or follows, are constantly shifting in like manner. So long as journeys shift thus, it would be difficult to name definite meal hours, if desired, and the meals, notwithstanding the shifting, would probably, should any regulations in regard to them be thought desirable, be better fixed by reference to the position in the journey than in the 24 hours.

No meal-times in plate glass grinding, &c.

127. In plate glass grinding and polishing, and in that of lighthouse glass also, there are no fixed meal-times, the machinery never stopping, except occasionally when it cannot be helped. Boys get meals in these stoppages, or while someone else takes their place, or, failing either of these, eat it at their work. Fixed stoppages for meals would cause the same loss as is incurred when machinery of any kind is stopped for meals; but it does not appear that there is any sound objection beyond this. The scratching of the glass from the stiffening of the sand or rouge, "would not matter in the grinding" (No. 2), as polishing follows; and in the polishing, in which it is feared "it would be an injury," it is considered at another manufactory that "an hour would not be long enough to do that." (No. 8.) These processes, it must be remembered, go on for the periods above named, *i.e.*, for from 12 to 16 hours, and cause a deafening noise, with constant irregular motions perplexing to the eye. An escape for a short time into a quiet place and fresh air would be a great relief. Smoothers have meal-times, but occasionally work in them.

Regular in other departments.

In other departments of work an hour and a half, and in some Scotch works two hours, is allowed and taken for meals, but flint-glass cutting shops, owing to their state, and the quality attributed to the atmosphere in them, are not desirable places to take meals in, if it can be avoided.

X. HOLIDAYS.

Q.

Intervals in work in glass houses.

128. In glass houses, the part of each week not occupied by the journeys or turns, is available as a holiday. The interval between two journeys in crown and sheet glass houses is generally as much as 30 hours, "from 29 to 32 or 33 hours," "30 hours," (compare Nos. 44, 46, and 47), and in bottle houses from 13 to 16 or 18, all allowing more than is required for sleep. The intervals are often much longer, owing to delays in the founding. At a crown and sheet glass manufactory, the spare time was calculated by the firm as equal to two whole and two half days in the week. (No. 49.) In most, work is finished by 4 on Saturday afternoon, but in some cases is later, occasionally as late as midnight, but scarcely ever later than that. In all the larger flint glass houses, Saturday, and usually more or less of Friday, or in some cases of Monday, is time also not occupied in working the glass, and therefore is available for leisure by the glass makers, deducting a portion required for sleep, after the end of the working week.

129. But in the glass house departments of flint glass, as well as other works, boys are found, out of the working period, doing odds and ends of work, such as getting things ready for work, or helping while pots are being set; or they come down, as one says he does, on Sunday, to see how the founding is getting on, and if there are any potsbroken, as they can calculate from that whether the beginning of work is likely to be delayed. In some large pressed flint glass works, a boy says, "after the "regular work is finished, we are forced to come again Saturday morning to do odd things, and are "fined if we don't." (No. 149.) I have often found boys in glass works of all kinds in this way out of the working times. They like to hang about and see what others are doing, or to talk and play, or to wait till the set in another house are ready to go. A boy 10 years old says, "We were 'laking' about" (at 11 at night) "till the other holes had got done. When we have done we like to 'lake' about, whether "we are tired or not." (No. 195.) Much of the time which might be turned to account goes in this way. In fact, as I have been told, it is difficult at times to get boys out of the works at all. In some of the smaller flint glass works, Saturday is occupied in work, and, as remarked in rare cases, boys have to work through Saturday or Sunday night, or both, and one boy speaks of making glass on Sunday. (No. 133.)

Other holidays.

130. In other departments of glass work, a half or short day on Saturday is common, and the other holidays probably are the same as those in other kinds of day work in the neighbourhood. At a large plate glass manufactory, where there are holidays at Whitsuntide, Christmas, and the wakes, these are at times followed by overwork to make up. In some Scotch bottle works there are four holidays in the year, two days at the new year, and two at Glasgow fair in summer.

XI. TREATMENT.

Need of inquiry.

131. Till I had visited a number of works, chiefly flint glass, I had hoped that it was not necessary to give attention to such a point. I was led to alter my mind. I would gladly pass over the painful results brought out, did I feel that I could properly do so. I prefer not to use words of my own to characterize the treatment which it is shown that boys meet with, and in too many cases and in too great a variety of place and circumstance to be regarded as merely exceptional. But I ask attention, as I feel that I cannot, consistently with my duty to the class concerned, help doing, to the simple, and, so far as I could judge, apparently entirely trustworthy accounts of some of the boys, and two or three other witnesses. From the nature of the case, I feel bound to keep back the names of some of the boys, and also of the particular places in which they work, so as to avoid giving a clue by which they might be identified as the boys examined there by me. This is my only means of guarding them from the risk to which their evidence might expose them from fellow-workers of the class of whom they speak, as I have had to assure a boy that I would do.

Ill-usage.

132. The kicks and blows inflicted by men on the young helpers, who are so useful to them, are bad enough, but the curses and bad language, which cause no bodily pain indeed, but without doubt harden and embitter the young mind, are probably, at least by the better class of boys, dreaded as much, and in their lasting effects must be worse. Two or three boys have spoken to me with horror of the language used to and around them. A boy ill in bed told me "They use such bad language and curse "at you so that I have come roaring for it at one o'clock in the night. One man, for whom I worked, "was very bad. He has got me up in a corner and knocked me down and kicked me as I lay, and I have "had bruises all up my back from it. He would be like mad at you sometimes." (No. 224.) Another boy, also ill in bed, after speaking of the like swearing, says, "They are awful brutes, and would "do anything at you. I have seen them knock boys down and kick them terrible when on the "ground, so as to make bruises on the body and legs. Once I was taking in a glass and fell down "and broke it, and when I came back and told the master (workman?) he jumped up and run at me, "and knocked me down and kicked me. There was a great bruise on my thigh from it. I saw a man "hit a boy of about 12 on the back of his head with the blowing iron, which had some glass on the "end of it, and cut his head open and made it bleed." (No. 220.) Another speaks of the same language, and hitting with the iron, adding, "When they are in a passion they'll say anything or do anything to "you; its nothing to them." (No. 222.) Another says, "Sometimes the men will tell you to jump and "do their liking; at other times they will just knock you down." (No. 184.) Another, a boy of 12 years old, says, "Have been struck with the 'double knife' so (clenching his fist). One man hit me over the "head with a het (hot) pipe, but it did not burn me; I had my cap on. * * * * Boys many times "have to run off from work because they are frightened of the men." (No. 226.) Another, a boy of 11 years old, says, "Have been knocked down two or three times, and have seen others what work with "me knocked down. They kicks us too on our backside. Have been hurt so myself, and seen a good "two or three hurt by it so that they could not go on with their work." (No. 229.) A manager states a late case in which one of the men "knocked the boy down, and kicked him repeatedly when down, six "or eight times." The police were applied to, but "somehow the man was let slip." (No. 206.) A master says that "The boys are very badly treated. The men are brutal, &c., kick them and cuff

"them too hard, and perhaps make their mouth bleed." (No. 148.) Another boy of 11 years old received from a man in the glass house a kick which, as the surgeon who attended him states, "had "cut the lip completely through, and knocked a tooth out. "If the kick had been on his head the "boy might have been killed." (No. 230) See generally Nos. 219 to 231 inclusive, and some other passages here and there in the evidence, *e.g.*, Nos. 84, 118, 133, 134, 195, 202, 203, &c.

Treatment improved.

How.

133. It is right to remark, however, that while several persons have spoken to me of the treatment of boys in glass houses as having been formerly very bad, most whom I have asked say that there has been a very great improvement of late, and that they do not believe that such treatment now exists, at any rate in the works under their care, or in those with which they are any how acquainted. One of the boys, however, referred to was found in works in which the manager expressed such a belief. But as a rule there is no doubt that the general conduct of the men and the treatment of the boys depend very greatly on the amount of attention bestowed by principals, and the directions which they give to their managers on the point. Where, as is often the case, special instructions are given on the point, and any corporal punishment by a workman forbidden under strict penalties, and a responsible and efficient general manager, distinct from the mere working manager or head glass maker of a house, is employed, a great security is afforded, though even this is not always effectual. But the control of a mere head workman is not likely to be sufficient for this purpose, though useful as regards the work itself. He is too much occupied with his own work to see what is going on, perhaps the other side of the furnace, and thus out of his sight.

Are complaints likely?

134. I have also been frequently told that the working class, including boys, are now so independent that they would not stand any ill-usage, but would at once appeal, if not to their masters, to the law. There is, however, probably, much truth in what one of the boys says, "We do not tell the master, "they would beat us worse then" (No. 220; cf. also No. 230), apart from the common honourable feeling in working boys, as amongst school-boys, against telling tales. And no doubt too, as stated, "Parents often send their boys back when they run away" (No. 202.), perhaps thinking it, as it may sometimes be, a mere excuse for idleness. I should remark that some boys, while speaking of their ill-usage by some men, have spoken of others as very kind to them.

Little importance attached to the matter.

135. But I must here own to some surprise at the little importance which I have found attached by official persons and others not engaged in the manufacture who have had occasional cases of ill-usage came under their notice, to this question. Wishing to learn the particulars of a case, in which a man had been summoned for assaulting a boy in a glass house, but which was "not proven," and the books at the police office being too voluminous to allow of my being referred to them, I applied to the mother, but she, perhaps suspicious of my object, or at any rate unwilling to have the case brought to notice by me, assured me that it was nothing but a simple correction such as the boy deserved. Why then was the man summoned? The charge included, besides other words of assault, "strike, "throw to the ground, and otherwise abuse," but these words may be part of the common Scotch form.

More than mere correction.

136. What boys speak of as hittings, even though with the iron, or kickings, may, sometimes, be merely slight blows, meant as a proper correction for a fault, and such rough and ill-taught boys, as a large mass are, must often be very provoking, sometimes from carelessness, sometimes from fun and mischief. "It's for my own good," says one boy. (No. 172.) But it seems plain that in many cases the chastisement exceeds the bounds of fair correction, and also that it is administered sometimes when there is no fault at all. Perhaps a boy, as in one of the cases quoted, "fell down and broke it" (a glass), or, as another says, "You know, you can't help spoiling a few things, and if you do spoil one "they say nothing, but kick you." And when boys work such an excessive number of hours as referred to above, what may seem carelessness may plainly often be only the result of positive inability to work properly, arising from sheer exhaustion.

137. Out of glass houses I did not think it necessary to make much inquiry as to usage, and have no reason to believe it to be anything but good.

XII. Accidents.

Burns in glass houses.

138. In glass houses no machinery, except presses worked by hand, is used, and accidents of other kinds are seldom serious. They are chiefly from burns and cuts from the flying of hot metal, or from getting in its way when wielded or carried about on irons, or falling on it when left about on the ground; slight, though painful, external injuries, particularly about the face and hands, from these causes are very common. A mere burn on the ankle from hot glass falling into the boot has been known to lay a person up for two months. (No. 202.) Occasionally clothes get burned, and even flame. (Nos. 42, 43.) It strikes a stranger as wonderful that burns are not constantly happening, and I have found it difficult in a busy house, where many workers are carrying metal about, to choose a safe place to stand in, and even then have become aware of the approach of masses of hot metal only by feeling the heat close to me. But boys soon get great experience and dexterity in being in the right place at the right time, and getting about their work safely, especially after a burn or two from the want of these. Putters-up in bottle houses need to be very careful, and, on this account partly, must have had some experience of a glass house as takers-in before they are fit for their work.

Grinding machinery, &c., and cuts.

139. Out of glass houses accidents are rare, and not often serious. They consist mostly of cuts from the breakage of glass, or hurts from getting caught in the machinery. That used in plate glass grinding or polishing is the kind in which there appears the chief risk. An upper surface is moved rapidly about over the surface of the glass to be ground, which lies on a flat "bench" or table. Parts of the moving surface, or the cranks which work it, shoot rapidly backwards and forwards, sometimes with very irregular motions, and thus in one moment project over a space which a moment or two before looked all clear for standing on, and close to where boys stand.

Fencing desirable.

140. I made no inquiry on the point, and there may, therefore, be difficulties of which I am not aware, but it strikes me that a rail marking the limit which could not be passed with safety, and which would clearly show if a boy got within it, would be an advantage as a security without interfering with the work. (See, however, Report of Children's Employment Commission, 1842, App. l. 16, Nos. 48,

49, 52–57.) In one case, when I wished to pass down a grinding shed, in which the space was somewhat narrowed by a temporary obstacle, it was just doubtful if there was clear room, unless I timed my passage to the exact moment, and I was therefore taken round by another building. I have also had to be careful in standing to ask a boy questions. Some cog wheels which I saw in one large polishing shed close to the ground, and amongst which boys work, might with ease, and certainly should, be covered over. One boy had lost an arm, another a leg in them. Serious accidents, however, from any machinery seem to happen but seldom, and then chiefly from wilfulness or more than usual carelessness. The only fatal case which I heard of was from a boy stepping on a table while at rest, but unfortunately at that moment put in motion by another boy.

141. The surgeon who attends some works employing 300 children and young persons, besides many hundred adults, where machinery of this kind is used, and large quantities of crown and sheet glass are otherwise handled and cut up, states that cuts requiring his dressing "occur several times a "week, almost daily, but they have never occasioned loss of life or limb." (No. 22.)

XIII.—WAGES.

Boys' wages in glass houses.

142. In the lowest stages of glass house work the lowest wages paid to boys, including the over work, or excess of the actual over the nominal week, usual in many, are about 5*s.*, sometimes 1*s.* or so less. In these stages boys are said to be paid at a uniform rate for one kind of work in the same place without regard to age. Boys' earnings appear to be highest in bottle works. In Glasgow takers-in get from 7*s.* or 8*s.* to 10*s.* a week, and putters-up 1*s.* or so more. At one manufactory there the takers-in get from 10*s.* to 13*s.*, and according to the master even 15*s.* At two others the fixed wages are 5*s.*, and at one of these the overwork sometimes is enough to make up the whole amount to 11*s.* In Dublin a taker-in, a boy, only 11 years old, gets 6*s.* or 7*s.*, the fixed wages being 4*s.*, and the others, doubtless, as much. At a town in the north of England a taker-in, a boy only 11 years old, gets 8*s.* or 9*s.* usually, and has got 9*s.* 5*d.*, his fixed wages being 5*s.* In Yorkshire a boy, only 10 years old, gets 8*s.* 6*d.* a week as putter-up.

Very high in bottle houses.

Elder boys and men.

143. As boys rise to the stages of regular glass making, their wages rise in proportion, varying with the terms of their apprenticeship, if apprenticed, or their proficiency in work. Some have reached the highest stage long before being grown up, some never reach it at all. The minimum of wages to be paid to flint glass blowers was agreed on by the masters and men, at a conference in 1859, at 22*s.* for workmen, 16*s.* 6*d.* for servitors, and 12*s.* for foot-makers, per week, *i.e.*, of 11 "moves," or practically 33 hours, more being paid for the usual moves "over," increasing this amount by probably towards a half. The actual wages would, no doubt, with fair workers, be some way above the minimum named. A bottle glass manufacturer states that in the then current week his hands would make as follows; viz., finishers, from 6*l.* to 8*l.* a week; blowers, 3*l.* 10*s.*; gatherers, 2*l.* 5*s.*; putters-up, 1*l.* 5*s.* to 1*l.* 7*s.*; takers-in, 15*s.*, and that these were not much above his late average; but such earnings are probably exceptional.

At grinding and cutting.

144. Plate glass grinders and polishers get 4*s.* 6*d.* or 5*s.* a week, or, with overwork, about 2*s.* more. Some of the younger females who smooth, working with relations, get no wages, but have a trifle given them to spend. The smoothers generally are said to get good wages. At flint glass cutting, boys rise from 4*s.* or 5*s.* a week, but some odd boys, who merely wait on men in the shops, get less, *i.e.*, down to 2*s.* 6*d.* There are several other rates for miscellaneous work.

Small benefit to the boys.

145. Boys generally get a trifling part of their usual earnings, such as a few pence, to spend for themselves, and also what they make by working over out of the usual course, as by working in another boy's place. Sometimes 6*d.* or so is put by weekly for buying a boy's clothes, or some such purpose. But there does not seem to be much encouragement to boys saving; and one instance struck me as very discouraging to provident habits in a boy. A boy who gets 6*d.* allowed him by his parents out of 10*s.* or 11*s.* a week, had saved up in this way 17*s.* "But when my little sister died they buried her "with it. Father and mother told me to draw it, and the bank man asked me, 'Was I going to draw it?' "and I told him it was to bury my little sister. I have not put by any money since." (No. 207.) He will, doubtless, be likely to make sure of his sixpences for himself in future, by spending them at once, *e.g.*, in going to "see niggers," as one boy spends his, or in some present way. His father is regularly employed in the same works. The boy says that he has "no clothes" for church-going, no trousers but his working pair. Indeed, in too many cases, the use made of the very high wages is very indifferent. Some bottle makers are spoken of with a weekly score of 25*s.* a man, for drink, against them.

XIV. INFLUENCE OF EMPLOYMENT ON PHYSICAL CONDITION.

Glass house work considered healthy by many.

146. The mass of employers of any importance, or their representatives, consider glass house work to be healthy, notwithstanding the exhausting nature of the work, the variations of temperature, irregularity of sleep, and other apparently unfavourable circumstances already referred to, provided that men are temperate. Some of the men whom I have asked are of the same opinion. On this side of the question it is said that the men in general enjoy good health, and that many continue the employment to a considerable age, *e.g.*, up to 60 or more, and I have seen several elderly men at work. This is attributed in part to the very nature of their employment, their work furnishing considerable muscular exercise, and the perspiration caused by this and the heat keeping them free from common complaints. As a proof of general strength, one manufacturer states his belief that many prize-fighters have come from glass houses. From these facts they infer that there can be nothing in glass-house work unfavourable to boys, and say that as a fact they do not find any bad effect amongst them. The opinion of the medical attendant of some large crown and sheet glass works is to the same general effect, subject to certain qualifications. (No. 22.) Many of these opinions are entitled to much weight.

Intemperance.

147. All the evidence seems to show that the healthiness of the work as regards men depends greatly in this, as in so many other employments, upon their temperance, which, however, in this work the very heat and exhaustion make more than usually difficult, and intemperance is agreed to be still very

general, though much diminished in many cases of late. This tendency to drink is illustrated by the fact that in visiting glass houses I have repeatedly been asked, more or less directly, for money for "drink," a request which has never been suggested to me in works of any other kinds. I have been followed and importuned for it, and quite unable to make a man understand that in my capacity it would not be right for me to give anything. A number of elder glass makers are unhealthily and uncomfortably fat, which is attributed to the amount of beer which they drink. (Nos. 134, 130.)

Eyesight.

148. The glare and heat of the furnaces affect the eyesight of those who have to stare into them to watch their work, but this does not fall to any extent to the lot of boys.

Bad effects on health.

149. It is plain, however, that under ordinary circumstances even men do suffer much from the heat and exhaustion, and that in several cases the work tends to bring on, or at least develope, affections of the chest. This result, which is attributed in part to the strain on the lungs in blowing, is naturally most likely to be found in persons who have worked at blowing too early, or of a too constant or heavy kind, or are naturally inclined to weakness of chest. The son of a large bottle glass manufacturer speaks of a "great mortality" amongst glass makers. A working flint glass master in London, now little over 40, has "known a hundred glass blowers die." (No. 134.) But most of the injury is attributed to intemperance and careless habits. In hot weather in summer the heat is very exhausting, and even men are known to turn faint, and have to give up work. "Then sometimes even the strongest men "have this faintness come over them," says a bottle works manager. A flint glass blower has fainted himself, and known other men "turn faint, and obliged to knock off." (Nos. 206, 134, 158, 130, &c.)

Boys more liable to be affected. Medical opinions.

150. Such effects being felt even by grown men who have become hardened to the work, cannot well be less felt by young or growing boys working under such conditions as described above, and thus exposed to the same or like influences. The statements of some medical witnesses (Nos. 230–235, 245), are referred to on this point, particularly that of a gentleman (No. 232) who has had ample experience of the bottle glass manufacture, both as a medical man and as having been practically engaged in it. A flint glass blower speaks strongly on the point. (No. 59.)

Physical condition of boys.

Legs and feet.

Colds.

Weariness and sleepiness.

Effect on head.

Fainting.

151. It is clear from the boys' own accounts and evident condition that they do often suffer not only from the immediate effects of their work in exhaustion, languor, and headache, but also from chills on exposure to cold air, causing in some cases serious chest and other affections. The general appearance of boys who have been any length of time in a glass house is, as a rule, decidedly unfavourable. Their complexion is usually pale and unhealthy, and the bodies of a great number are slight and small for their age. Some are very ill grown about the legs, a fact probably attributable to the excessive exertion of these limbs. A medical witness states, "Nearly in all cases there is great weakness of the "knees and ankle joints, so much so that the knees press against each other. This * * * gives the "boys the appearance of being cripples." * * * "I have frequently seen the little fellows with "blistered hands and feet, and scarcely able to hobble along." (No. 232.) The feet of takers-in get sore and blistered, especially in summer, with the floor "so hot, and the perspiration on their socks and "shoes," often old and thin, and the boys ill looked after at home. (Nos. 134, 133, 215.) Many have coughs or hoarseness, and complain of these as brought on by the heat, and by chills from going out into the cold, or from cold water. Not unfrequently they fall asleep at work from the heat or weariness, or both. A strong-looking boy of 13 years old, a taker-in in pressed flint glass works, says, "When you "come to work at 9 at night you are very sleepy, and have to sing to keep awake, and the same in the "day sometimes. It is through the heat." * * * "With standing before the heat so and then "drinking cold water your head turns a kind of dizzy. If we could get a chance of it we would be "always drinking pretty nigh." (No. 149. So also Nos. 69, 23, 25, 104, 118, 119.) Others also complain of their head. A boy of 11 years old, a shovelholder in a sheet glass house, says, "Have "the headache very much, and most when working two journeys running;" and another, older, working with him, "Have the headache very often; am never more than two days without it; am giddy "sometimes with it." (Nos. 42, 43.) A putter-up in a bottle house who complains of "the heat and "sweating," once at least) "had a fit from it and fell down" at his work. (Nos. 207, 206.)

Drawing arches.

152. Drawing arches is not unnaturally the part of glass house work most universally regarded as unhealthy. A girl 12 years old, who, however, works only four hours a day at it, but came, she says, at eight years old, complains very much of her head and throat, and was told by her doctor to give the work up in summer. (No. 178.)

Blowing.

153. From the constant exertion of blowing, the muscles of the cheek sometimes become strained and relaxed, and the cheeks then in blowing swell out like large balls. This, as pointed out to me by a medical man, is an index of the amount of strain which must be going on in more vital organs.

Evidence compared.

154. The above are merely illustrations of the kinds of physical effects which appear to result from the work as carried on, but they are fully borne out by a very general agreement of the younger workers examined, as well as by other evidence and my own observation. The different opinions expressed by several persons may be in some degree accounted for by looking at certain facts which must not be forgotten.

Present glass makers represent the strongest.

155. Many glass makers are muscular and active men, and doubtless enjoy good health, as represented, notwithstanding an excessive spareness of flesh or a worn expression of face, which may often be observed. Most, no doubt, as is the custom, rose from being glass house boys, and probably cannot have received much injury, as they have held out so well. But from the nature of the work, and in the heavier branches more particularly so, a person is not likely to rise to the position of a glass maker, or at least of any but the inferior work made in small places, unless he has muscular and constitutional energy and strength, and in some work to a very considerable degree. (Nos. 84, 203, &c.)

Large proportion of boys who leave the trade.

156. The surplus of glass house boys over what are required to supply the vacancies amongst actual glass makers must in some cases be very considerable. Some idea of what this surplus must be in flint glass works is given in the elaborate statement of the manager of some leading works. (No. 57). Boys coming there as takers-in between the ages of 11 and 13, usually leave at about 14 or 15, "as from "the unskilled nature of their employment there is no progression of wages, and there is not much oppor-

" tunity of rising to a higher position." Out of 80 or 90 employed there as takers-in in the course of eight or nine years, 12 being the full number at any one time, only four, or less than five per cent. have been advanced at that place to be foot makers, the lowest stage of actual flint glass making, " the other foot-" makers' places being supplied by persons who have received their training as foot makers elsewhere, " or who have descended from a higher stage." (No. 57.) Many, no doubt, shifted to other works, but promotion cannot at any place take off a large proportion. (See also No. 165.) A promising boy is likely to be kept till a vacancy offers. The masters are restricted by the trade union rules from "putting on," *i.e.* as glass makers, more than a very limited number of boys, *e.g.*, according to the rules as they stood a short time back, and, so far as I am aware, still stand, only "one to three chairs (or sets " of hands), two to five, and so on in proportion," the object being to promote the interests of the men by limiting the supply of trained hands available to masters. In bottle houses, two out of each "hole" or set of five do mere boys' work, and it seems that something of the same principle must necessarily hold good as in flint glass houses, though a bottle manufacturer thinks that nearly all now get promotion. (No. 180.) He allows that the great growth of the bottle manufacture of late years "creates a larger " demand for boys to be taken on in the trade."

Likely to include the weakly.

157. The surplus who must thus go off into other employments or inferior glass work, as they become too old for mere boys' work in glass houses, include no doubt the least efficient, and probably most whose health has been much impaired, and the bad effects, where they exist, are thus likely to be removed from the notice of regular glass manufacturers. (No. 157.)

Effect of night work.

158. As regards the effects of night work on those engaged in it, there is a common belief on the side of employers that it is not injurious, and some rest their objection to legislative interference partly on this ground. It scarcely seems to need medical or other authority to prove that night work is in itself undesirable, especially for boys, if it can be avoided, though such authority is not wanting. (Nos. 22, 230, 232, 233, 234.) See also the statements of boys and others. (Nos. 43, 149, 158, 159, &c.) The common practice in iron works of changing the night work week by week, points to the same conclusion. It was remarked to me by the surgeon of a hospital, of a boy who had come as a patient from some iron works, that he had the enlarged pupils usual in those who work much at night. I am also informed by the resident physician of one of the London hospitals, that it is found absolutely necessary to give the nurses change from night work, as their health would otherwise break down.

Low condition of body during the night.

159. The medical men, of whom I have questioned several on the point, are unanimous that not only is exposure to daylight essential to full health, but that the body is in a lower condition, less equal to exertion, and more susceptible of injury during the night, especially that part of it which follows soon after midnight; and I was informed by the hospital physician just mentioned that the conditions of the body which prevail in different periods of the 24 hours had been ascertained by a long series of observations, the lowest being in the period following on midnight. The importance of daylight and the effect of night work are also spoken of by a medical gentleman quoted in the evidence furnished by me on the "Metal Manufactures of the Sheffield District" (*q. v.*, Nos. 283, 284.)

Absence of special diseases.

160. I should not, however, close these remarks without adding that on the whole there is no clearly marked class of serious disease generally agreed to prevail amongst glass makers, such as is found in the case of some other manufactures. The chief effects, where any are felt, are probably those resulting from the exhausting nature of the employment, or from chills to which the body is exposed when in an exhausted state, or arising mostly in persons of weak chests from the nature of the work, and likely to be attributed to common colds.

161. The extract from the census given above (B. No. 32.) shows that glass work is one of the occupations in which the proportion of persons in the lower periods is high as compared with those in the upper periods. The number is highest in the period from 15 to 20 years, viz., 2,330; from 20 to 25 years it is 2,102; and from 25 to 30 years, 1,717, or slightly above that in the period from 10 to 15 years, which is 1,569. In the period from 40 to 45 years, the number has declined to 951, and in that from 60 to 65 years to 293. The causes which seem likely to contribute most to exhaustion of vitality are found in the glass house departments of the work.

Flint glass cutting not considered healthy.

162. There is a general agreement amongst both employers and workpeople that flint glass cutting is less healthy than the glass house work, owing chiefly to the use of putty, and the more confined and sedentary nature of the work. Colic and costiveness, and loss of power in the hand or thumb, or "putty drop," or a feeling of lowness and fatigue, result in some cases. (Nos. 62, 63, 65, 79, 94, 97, 98.) One of these witnesses (No. 79) attributes the drop of the hand to the strain from clutching the glass tight. The effects, however, are of a kind which it takes a course of years to fully develope, and they are not noticeable to any important extent amongst the few young engaged.

Plate glass polishing.

163. The rouge or red powder used in polishing plates or sheets of glass is not noxious, and, according to the experience of the medical attendant of large works, has no effect upon the lungs or air passages. It causes constipation, but "it is not a serious ailment." (No. 22.) A well-known London physician, Dr. B. W. Richardson, in his evidence given in that collected upon the "Metal Manufactures of the Birmingham District," (*q. v.* Third Report, b. No. 751,) states, "In my practice I have observed " in other (*i.e.* other than glass paper) manufactures in which girls or boys are employed great evils " arise from the inhalation of dust and (amongst other kinds) from rouge dust."

Other glass work.

164. Smoothing is fatiguing for girls, and makes the shoulders and legs ache. Other parts of glass work call for no particular notice.

XV.—MORAL CONDITION.

Glass house hours make school attendance extremely difficult.

165. It is plain that work in a glass house with such a system of hours as described, when once begun, makes any further instruction in day or evening schools at least highly improbable. It does not indeed make it absolutely impossible, but it throws such extreme difficulties in the way as can only be overcome by extraordinary exertions, which of course can rarely be looked for, and, if made at all, can hardly be maintained. Case after case is mentioned where efforts have been made by employers

or men to get up a school for the boys, but have been given up in a very short time chiefly from the want of interest shown by the boys, and the difficulty of getting an attendance. This is only natural. Though glass houses of most kinds leave certain intervals of spare time in the week, yet these are altogether uncertain and variable, and often fall at times when they cannot be turned to account for school purposes. "I was so often fetched away for work." (No. 42.) The boys, too, are often tired, and physically disinclined for school (Nos. 157, 184, 59, 84, 165), and, in any case, unsettled, and not disposed or likely to make a systematic use of their spare time.

Flint glass house hours.

166. In flint glass houses, except the smallest, Saturday is a leisure day, though work may occasionally continue till the morning. But Saturday is not a day on which much is done at schools. On Friday or Monday, or parts of them, a boy may have to be at work or not, or taking rest, as it happens. The six-hour turns leave no proper time during the working period of the week. The Messrs. Osler, of Birmingham, have made great exertions to induce their boys to attend a night school, paying the fees, and giving a bonus for good attendance, with some results. (Nos. 56, 57). On most nights the boys in the first turn are at work, and cannot go, while those in the second can only go at the sacrifice of part of their short period of rest, which a workman wished to bring to my notice, though otherwise approving of school. "This set leave at 7 p.m., but if they go to school then till 9, as they have to be "back at work about midnight, it leaves them only two or three hours for sleep, and that ruins the "constitution." (Nos. 59 and 58.) The difficulty must necessarily be the same in all regular flint glass works. A Scotch firm require reading and writing as a condition of employment, but find a difficulty as to this in the glass house department. (No. 165). The Messrs. Pellatt have or lately had a school for their works.

Crown, sheet, and bottle glass house hours.

167. In most crown, sheet, and bottle glass houses the intervals of leisure fall at constantly varying hours of the day or night, depending on the journeys, and if there are two or more houses in one manufactory they are likely to vary, more or less, from each other, so that it might be difficult to get the boys together at one time. The difficulty arising from the irregularity is illustrated by a case in which a manufacturer built a school, and paid a salary to one of the workmen as a teacher, and the school-time "was arranged to suit the work, *e.g.*, if a journey was finished at 4 a.m., the man would take "them till 6 or 7, or it might be before a journey began." (No. 209.)

Spare time seldom turned to account.

168. The number of boys at one manufactory, or who can be got together at once, is rarely large enough to employ a regular schoolmaster, and probably few independent schools would care to take in boys at any chance time, even were a boy disposed or forced by his parents to go, which seems to be very rare indeed, though I have found such cases. Glass house boys in particular, from their neglected and backward condition, are not likely to find much favour as mere casual attendants at an ordinary school. (No. 49.) The case quoted is instructive, but not encouraging, showing that, with an estimated average of two days and two half-days in a week off work in crown and sheet glass works, and with every wish and exertion on the part of the employers to turn this to account for education, they have been obliged to give up in despair.

Instance of enforced school attendance.

169. The schools established by the Messrs. Chance, of Birmingham, of which some particulars are given elsewhere (No. 20), furnish an exception deserving particular notice. I found the schools not only still in full work, but all boys in the works under the age of 18 who were found to be below a certain standard in reading, writing, and arithmetic had been lately required to attend evening school. This followed upon an examination, which the firm had thought it desirable to have made, with a view of ascertaining the educational condition of the young employed in their works.

Difficulty as to Sunday school.

170. Even Sunday is more or less interfered with by the work of the week, being wanted for rest and fresh air, rather than the confinement of schools or places of worship. In crown, sheet, and bottle glass houses, in many of which boys are called up for work at midnight, or soon after it, occasionally before, they must, or ought to go to bed very early on Sunday. A boy left Sunday school on this account. (No. 42. See also Nos. 179, 188, 198, 203, 23, 44.) In a few cases work is still liable on occasion to go on till midnight on Saturday. In regular flint glass works Sunday is not encroached on, but in some of the small places in London boys here and there are employed all Saturday night or all Sunday night, or both, and even occasionally on Sunday; and a boy in Ireland speaks of drawing arches on a Sunday, if "the merchants want the bottles of a Monday."

Want of instruction shown.

171. Under these circumstances it is not at all surprising that glass house boys, who form the bulk of the boys employed in the trade, should be found to be, as they are as a body, almost entirely uneducated. Some of the cases of ignorance remarked upon in my report on the "Metal Manufactures of the Birmingham District" were found amongst glass house boys examined in that district. On extending my inquiry to the rest of the kingdom, the necessary details of other kinds were too many to allow of my testing boys' knowledge or ignorance much in detail, but the evidence shows that other instances of the same kind of ignorance might be added, and that the want of instruction is very great. Of the comparatively limited number of boys of whom I made inquiries on these points, it appears that many have not been at school at all, or only for a few weeks or months, or either never in a place of worship, or only once or a few times. It is a common opinion, and not only amongst Scotch men, that education is more valued in Scotland, than in either England or Ireland, but in glass as in other manufactories in Glasgow many of the boys are Irish.

Felt by employers.

172. The want of education and the difficulties in providing for it are regretted by employers. The remarks of a small master (No. 157) will be found of much interest on this point. A Dublin bottle manufacturer considers that "The great mischief of the employment is the want of education." (No. 211.) Apparently some preliminary education would be approved of. (Nos. 44, 49, 57, 68, 89, 103, 110, 117, 148, 165, 168, 202, 209.) A Scotch bottle manufacturer thinks that the "great fault of "the work for boys is that they get too much money for little boys," which enables them almost "to "put their parents at defiance;" and this independence he thinks was a great cause of their neglecting his school. (No. 209.)

Reasons why not felt by workers.

173. Another cause of the neglect of education probably is that glass making is very often an hereditary employment, men getting in and training up their own children to the work, and thus each

generation only follows on the steps of the former one brought up under the same unfavourable circumstances. The work is of a kind in which a good eye and skilful hand, with sufficient animal strength, are all important, and will command success and high wages without reference to any mere mental training, which has no direct bearing on these vital points.

Q.
Its importance to the whole trade.

174. In all branches of the trade, and in cutting as much as in making, or even more so, a scientific training of the eye and touch, *e.g.*, by means of drawing, and for artistic work a study of models and designs with a view of cultivating the taste, would be of the greatest service, and no doubt materially facilitate the process of learning and shorten the time. A leading flint glass manufacturer speaks strongly on this point. "This" (attending schools of design) "is everything to them. Two of the "best workers that I know have had the advantage of being taught drawing in this way, and I "attribute their success entirely to it." (No. 110.) It is wonderful what an amount of taste and skill and quickness of perception some of the men show even now.

Valued by some workers.

175. There are, however, both men and boys who show that they value instruction,—men who have found its importance from their own want of it, and do what they can to give a better chance to their own children or boys under them, and boys who by night schools or other ways strive to improve themselves. In this way at one manufactory a glass house boy raised himself to be clerk in the office, where I saw him, and another to be a "very good warehouseman."

Social separation.

General character.

176. From the nature and hours of their employment, glass makers are more or less cut off, less in some cases than in others, from mixing much with other classes, and form a set by themselves. Flint glass makers are a set as distinct even from flint glass cutters, though in most cases working in the same manufactory, as if they were engaged in totally distinct manufactures. Sheet glass blowers are spoken of by a manufacturer as a superior class, and several whom I have seen appear so, but some, at least, are rough enough, as shown by their usage of boys. Of other glass makers many are most respectable and intelligent men, and not only in individual cases, but in whole factories; but as a body they are spoken of as an untaught and intractable class. Flint glass manufacturers in particular complain of the degree to which they are hampered by the control of the men, exercised through their trade union. Their peculiar habits of life, and want of education may probably contribute much to causing or keeping up these difficulties in dealing with them. (Nos. 89, 157.)

Intemperance.

177. Intemperance is complained of as a fault common to glass makers as a class, but the temptation is strong. The complaint, of course, is merely general. There are nodoubt numberless exceptions of individuals, and in works where careful attention has been given to the point by principals, the best results have followed, *e.g.*, so that a whole set in a manufactory can be spoken of as "almost, without "exception, a thoroughly temperate and well-conducted set of men." The rules enforced by the Messrs. Hartley (No. 44.) are worth notice, as is also the consideration shown in protecting boys from bad example by a foreman in a flint glass cutting shop. (No. 79.)

Bad example to boys.

178. Where some or other of the men are so often drinking, and sending out boys for drink, the boys are naturally led into the same habits, from getting sips or drinking with the men. "These "apprentices will drink half-a-gallon in a day, sometimes, and that public house beer, too. It "must be very injurious." (No. 230.) Beer, however, is better for glass makers than "hard whiskey, "which burns their inside out," in Scotland. On certain occasions, in the course of work, masters have to pay drink money, to which one of them attributes very bad effects on the boys. It "causes so bad an example socially and morally that they grow up with the same tastes, and follow in the same footsteps as the men." In Scotch bottle works a boy says that on putting-up a furnace, putters-up and gatherers, the former of whom are usually, and the latter in some cases, boys, have glasses of whiskey, but the takers-in only ginger (beer). In England, a boy 10 years old makes the distinction that the men drink "drink," *i.e.*, ale, but the boys beer. Water, however, seems to be what is drunk in the largest quantities by young boys, which is likely to cause chills. (See also Nos. 86, 149, 90.)

General summary.

179. On the whole it is abundantly clear that the mental and moral improvement attributed by several persons to glass makers, of late years, is far from universal or complete, and that there is still great need of education and other softening influences, and also it is unhappily clear that the system and kind of employment are such as to make it unusually difficult to secure them.

180. Other kinds of glass work, and the class and number of persons employed in them, afford little room for special remark here.

XVI.—General Remarks.

Need and difficulty of legislation.

181. The account above given shows that the conditions under which a large number of children and young persons are employed in the glass manufacture of this kingdom are such as to suggest very forcibly the need of some legislative measures for the protection of this class of workers. On the other hand, it seems undoubted that as regards the glass making branch of the manufacture any limitations of the hours of labour of boys, and other like restrictions, which have been enforced in other employments, would be likely to cause considerably more inconvenience to employers than in manufactures of most other kinds. In these respects glass works have some points in common with iron works, but differ from them in being far less simple and uniform in system, and subject to much greater want of certainty in the processes carried on in the furnaces.

Length of some details.

182. The peculiar nature and difficulties of this branch of the manufacture have made me think it desirable to give a very full representation of them in a number of statements made by employers or their representatives. These details might indeed have been summed up generally, and put shortly in the statements of two or three persons, but in that case, consisting as they do of such a number of minute points, they might have failed to attract sufficient attention, and a mere statement that manufacturers generally expressed like views might have failed to make up for this. And, though I do not venture to hope that employers will regard the difficulties of their case as put forward, or capable of being put forward, by the present means so as to be fully and fairly appreciated by any persons not practically engaged in the business, I think it certain that they would feel that justice had not been done to the views which they

have kindly taken the trouble to express to me, if these were not represented in the most complete manner in my power. At the risk, therefore, of length, which I fear may be thought excessive, I have given these views in full, as expressed to me.

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Some sacrifice of others.

183. The time and attention given to these points involved a sacrifice of detailed inquiries and evidence from boys so full as might otherwise have been desirable, but the evidence which is furnished by them and from other sources is sufficient to show the general bearing of the employment upon them.

Not serious.

184. I also feel justified in expressing my belief that though I may naturally have failed to furnish a complete and satisfactory account of so complex a subject, still the facts and views stated do on the whole furnish sufficient grounds on which a fair practical judgment as to the employment, and the interests and just requirements of employers and employed, may be formed.

Limiting age of entering work. Needful. Free from objection.

185. It seems clear from all the evidence, including that of the manufacturers themselves, that one great improvement at least might be made without any serious inconvenience, viz., the limitation of an age under which boys might not enter on glass house work. I have seen one of the boys, whose duty it is occasionally to hold a piece of glass in a furnace to keep it warm and in shape for a man while he is away, nearly spoil a whole cylinder of sheet glass by his want of power, as was explained to me by the manager, to keep it turning properly, though the man returned just in time to recover the shape. In my judgment a considerable portion of this employment is, all things considered, severe, and unsuited for children under the age of 13, even if working only by day, and for not more hours than they are allowed to work in regulated factories. (See a medical opinion, No. 234.) The opinion of many manufacturers, and the practice of several, show that the trade might be successfully carried on under such a limitation. (See *e.g.*, Nos. 89, 148, 157, 177, 185, 117, 128, 110, 96, 165, 203, 209, 210, 211, 114.) A leading London flint glass firm has made it a rule for many years, and the Tabular Returns of four other flint glass and of two bottle glass firms show that no child under 13 is employed by them. Several other manufactories of fair size employ only from one to six or seven under that age, and in several cases some of these are not in the glass house department. The highest number of children employed by any one flint glass manufacturer from whom I have a return is nine, six of whom are in the glass house. But one or two large pressed glass manufactories have made no returns.* Some manufacturers, however, are of opinion that it is desirable to take boys, or at any rate to be able to take them, a year or two younger. On fairly weighing the evidence it will scarcely be doubted by any thinking person that if children are employed in glass houses at all, it should be for more suitable hours and with greater security for their well-being in other ways, than are usual at present.

Ascertaining physical fitness for work.

186. The evidence also points to the importance of another matter, as to which it does not appear that there would be any real difficulty, while it would be a great benefit and security to boys, viz., some mode of ascertaining the physical fitness of boys before entering on glass house work, and in particular before entering on any blowing stages of work.

Difficulty of limiting hours in glass houses.

187. But all manufacturers agree in expressing their opinion that the work does not admit of being limited to definite hours, and that a greater or less amount of night work is unavoidable, and also that the full number of boys, of whatever age those employed may be, must always be working with the adults. It seems certain that a prohibition of night work by all under the age of 18 would, in most kinds of glass house work, cause considerable interference not only with the established, but probably with the most profitable mode of carrying on the trade. I endeavoured to learn from manufacturers what in their opinion was the highest age at which such a prohibition could be fixed without real injury to their trade, but I failed in most cases to get any definite views on this point, the persons questioned not having directed their attention to the subject put before them sufficiently to enable them to speak definitely on such a detail. However, one of the largest employers considers that the age "would "depend chiefly upon the neighbourhood. In some places there would be no harm in fixing it as "high as 15 or 16, and for our trade (crown and sheet glass) generally 14 might be fixed.* * * After all, "however, the question of excluding boys under any given age is a matter which affects the interest "of the parents and the boys rather than of the manufacturer." (No. 44.) So for flint glass houses, "not under 14 probably, but I cannot say whether 16 would be young enough" for beginning. (No. 56.) "I do not see any necessity for boys under the age of 14 in a glass house, but between that age "and 18 they are important." (No. 68.) "I consider that under that age (14) boys are not firm and "strong enough or their constitution either for such work. It is cruel to have young boys at it." (No. 159.) They must begin "shortly after that age (13), at latest within a year or two." (No. 89.)

Up to what age practicable.

188. In this, however, as in other respects, on weighing the opinions of different manufacturers, it will be important to bear in mind that, in flint glass works in particular, there is a great difference between the requirements of the work in producing the best kind of glass made in manufactories of some size, and of the inferior kind of work done in small places.

Actual ages of entering on skilled work.

189. But the opinions of this kind not being numerous or definite enough to form a safe guide, I endeavoured, as a help towards a more accurate judgment on this point, to ascertain the ages at which as a fact boys or youths are commonly taken on into the various stages of glass making, such as foot making, &c., coming above common work of boys as mere helpers, and at which it was considered most desirable so to take them on. A number of statements on these points will be found scattered throughout the evidence. The general result is that the practice itself varies to any extent in individual cases, but that, other things apart, it is seldom thought desirable to take a boy on to such stages older than 16 or younger than 14. A competent judge fixes 16 as the best age for beginning foot making. (No. 110.) Variations also arise from the branch of work and the capacity of the boy.

Preliminary training needed.

190. Before a boy is put on he must get some familiarity with glass house work, as the work of the younger boys enables them to do. The time, however, usually spent by them in mere boys' work is far more than is needed for their mere training. The chief thing which they have to learn is care, and the importance of that is soon impressed upon them. The periods actually necessary for this preliminary training are spoken of by some witnesses as extremely short, and, for all that appears, they may be well so.

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* A return from one of these, not the largest, subsequently showed a rather larger number.

May be too long.

191. It is highly probable that not only is a boy no better suited for becoming a good glass maker by spending several years in a glass house before he begins, but that on the contrary he is less suited, having been more or less used up and weakened physically, and having done his work only mechanically, and without occasion to apply his mind and observation, as he would if his chance of beginning glass making were nearer. "A boy of 13 or 14 learns quicker than a younger boy." (Nos. 177, 159.) It is plain from the evidence that a boy's progress depends mainly not on the time which he has spent in the work, but on his natural aptitude, attention, and docility, with the amount of care and interest which men bestow on training him; and hence, that in the event of any restrictions on the labour of young boys much time might be gained by the selection of suitable and educated boys, and bestowing more care on their instruction in work. (Nos. 84, 96, 157, 177, 185, &c.)

Difficulties in flint glass houses.

192. The difficulties which would arise in the flint glass manufacture from any restrictions on the labour of boys in glass houses are fully represented in the statement furnished to me by Mr. Percivall, the manager of the Messrs. Osler's works, with whom I had full discussions on the subject. (No. 57.) The question of keeping up the supply of skilled labour by training boys early is probably of more importance in this branch of the glass manufacture than in others, the workmanship being more delicate and varied in this than in the others. In crown and sheet glass the work is of a much heavier and more uniform kind, and in bottle glass also the work is much more uniform, and far less artistic. The regular 12 hours of almost exact day work, viz., from 6 a.m. or 7 a.m., till 6 p.m. or 7 p.m., which the established system in flint glass houses always gives, secures a large amount of time for training up young hands with day labour only. But the objection that a boy could not work in the alternate chair or set, and so, in effect, would have his day unavoidably halved, requires to be weighed. Its importance, however, seems to me somewhat over-estimated. Though the work of different chairs often varies, there is sufficient resemblance to make it seem easily possible so to arrange as out of several chairs to choose two in which a boy could work for the whole day, if that were the only means by which he could do a whole day's work. As it is the same chair may have to change its kind of work. The evidence also gives good reason for believing the practice of limiting the work of a set of hands to six hours at a time to depend on custom, rather than on any necessity or very clear advantage. The small proportion of boys required, or, indeed, allowed, to be in training at any one time to supply the vacancies that arise in skilled glass makers, and the excess of younger boys over what can possibly be taken on as glass makers, are also facts of importance to be taken into account.

Meal-times important.

193. The question of meal-times is one of great importance to the boys. In glass houses there is no, or scarcely any, long continuous process, as in some other manufactures, liable to be interfered with by a cessation of work for an interval of a stated length. But in crown, sheet, and bottle glass works the variation in the hours of beginning work would make it impossible to fix such intervals at stated hours with advantage. Any loss of heat and time that might arise would be common to all glass houses.

Approach to a day of twelve hours in some bottle glass houses.

194. In bottle glass houses working six journeys a week, as many do, a general approximation to six uniform working periods of less than 12 hours each is necessarily made. How far it might be possible for others to approach this uniformity by adopting a six-journey system, in case any restrictions on night labour of boys made such a course expedient for employers, and drew their attention to it, might depend in a measure upon special circumstances, of which the quality of the fuel and materials which can be most readily obtained in a given place would appear to be the chief. The proprietor of some bottle works, making only five journeys a week, states in his Tabular Return that boys work at night "sometimes, but not as a rule; only in cases of necessity. It varies; for example, last week they did "not work during the night at all." At other works "the outwork journey is more often under 12 hours "than not" (No. 177); and at others, "If it were necessary it would be possible to arrange so as to "make the journeys fall in the daytime." (No. 206.) But others deny this.

An opinion as to regulation being practicable in them.

195. As regards this branch of the glass manufacture, the double experience of one witness, *i.e.*, both as formerly practically engaged in it, and as a medical man, constantly seeing its effects around him, gives authority to his opinion.

"I am told that the regulations in the factories are good, and work well. If so, I think that the glass "works ought to be placed under the same restrictions, and, from my knowledge of the works, I think that "the employers would not suffer in a pecuniary point of view, and the boys would not be *discounted*, as they "now are, for many worthless parents." (No. 232.)

Instance of actual limitation of hours.

196. At one of the largest bottle glass manufactories it has been found expedient to limit the working period to 11½ hours, without any regard to the quantity of metal which may remain in the pots unworked, and at one time even a shorter limit was fixed. The rule was made in consequence of the waste occasioned by the unpunctuality and dilatoriness on the part of the bottle makers. The fault of only a few was enough to throw the whole house behind. "Now, if they do not come punctually, "and work regularly, they have not the opportunity of making their full amount of work, so they do "not waste the time. We did not find any difficulty in introducing this rule, and it is decidedly "beneficial." (No. 192.) When more metal is melted than it is needful or desirable to work out, it is a common practice to lade it out or leave a larger quantity than usual in the pots, and to use it on the next occasion.

Different position of crown and sheet glass houses.

197. In crown and sheet glass houses, enough time has been gained by shortening the founding process, by means of improvements consequent upon the removal of the glass duty, to increase the number of journeys to four in a week, instead of three as formerly. It is stated that such a further saving of time as would allow of making six journeys a week is an object constantly aimed at, but of which no prospect is at present entertained. Till the present length of this process is in some way shortened, parts of the working periods, or of some of them, will unavoidably be thrown into the night.

Accidental delays.

198. In glass houses of all kinds accidental delays, from some cause or other, are apt to arise, and probably could never be entirely prevented, but all the evidence tends to show that proper appliances, materials, and attention can and do reduce them, as a rule, within moderate limits. In flint glass works such delays are not allowed to disarrange the hours, but only postpone the beginning of work for a

turn or two. I am informed by a plate glass manufacturer that in the works of his firm the metal is always ready for casting by the regular hour, and that he is not aware of any cause which need prevent this, though he has understood that such regularity is not found possible in all works of the kind. It is said, on the other hand, that though this may be possible where materials more of the nature of pure chemicals are used, as in making the better kinds of glass, it is impossible where they are coarse and impure, as those used for bottle glass.

Whether the place of boys could be supplied, and how.

199. With reference to the objection, strongly expressed, that in the event of any restrictions on the work of all boys under the age of 18, their place could not be advantageously supplied by men to make up the defect, I must express my belief that the objection is well founded as regards the work of the youngest boys in flint and bottle glass houses, viz., the takers-in. From what I have seen of their work, and from the facts stated as to the rapidity and frequency with which the boys must move about, it is, I think, plain that full grown men, whose limbs were thoroughly set, could not do the work with advantage, much less elder men who from a decay of their natural powers had sunk from regular man's work of any kind either in or out of a glass house. As regards these elder men, I fully agree with the remarks of Mr. Percivall. (No. 57.) He states, amongst other things, that "they would be " *much* more liable to lose work by illness, as I have abundantly proved by practical experience ; and " they would be even less able to meet the requirements of our work. * * * In short, it " must be self-evident that their vitality is approaching exhaustion." It would, in fact, no doubt, soon wear them to pieces. "A man could not do a taker-in's work. It would kill him, stooping and being " up and down so and about." (No. 84.) The work, however, could apparently be done, no doubt at some increase of cost, by elder youths not of sufficient ability to have become advanced in any superior employment. Most of the other miscellaneous boys' work could be done by men, to such an extent as occasion would be likely to require. The services rendered by boys as general "fags" may be disregarded, as, though highly convenient to the men, yet non-essential to the success of the manufacture. The substitution of elder men or youths for younger boys in any kind of work, or for any time, would, of course, cause an increase of cost, and probably without proportionate profit to the employer.

No peculiar difficulty out of glass houses.

200. In grinding, smoothing, polishing, and cutting plate and window glass, and flint glass cutting, and all work out of the glass houses, there appears no sound objection to regular hours, including fixed meal-times, and it is shown that in some of these branches there is great need of them. The troublesomeness of boys is often complained of, and in one plate glass manufactory a small number of men have been substituted for four times that number of boys. (No. 16.) Another firm have tried the same change, but given it up on account of the cost.

Sunday work.

201. In considering the probable effect of any legislative interference with the manufacture, it is fair to consider, as regards any injury which might be feared from foreign competition, amongst other disadvantages to which English manufacturers are said to be subject, that of their not working through Sunday as foreigners do. On the other hand, as compared with other manufactures and industrial occupations of this kingdom, it is fair to consider that in our glass manufacture Sunday is in fact turned to account for an essential part of the manufacturing process, though one carried on unavoidably and by the labour of very few persons, and that part of the Sunday's rest is in several cases drawn upon by the glass makers' work in some branches beginning and occasionally ending so close to the 24 hours of Sunday.

Character of glassmakers.

202. Lastly, it is hard not to conclude that the rough behaviour and want of feeling towards boys shown to exist too commonly in glass houses, though they have so greatly disappeared elsewhere and are so repugnant to the general tone of feeling, as well as, it is believed, to the practice which prevails amongst the working class at large in this country, are not in some way owing to the character of the employment which furnishes such examples. Some clue may perhaps be furnished by considering to what an extent this employment, by its exhausting nature and unseasonable hours, increases the difficulty as well as the importance of moral control in the workers, and at the same time cuts them off in a greater degree than usual from many educational, social, and other humanizing influences enjoyed by persons in most common employments.

Conclusion.

203. It is not unjust to say that the character of too many glass house workers certainly in past, and too often in present times has led to the class being often spoken of to me as rough and ignorant. The work itself is not of a gentle or softening nature, and a certain amount of roughness which may often be observed in tone and manner towards boys is no doubt more apparent than real. But, after all, the circumstances of the employment are less favourable to young boys as regards their moral improvement than many other kinds of work. There is no doubt much truth in the remark volunteered by an intelligent young glass house boy on this point. "No one knows nothing before he comes into a " glass house. You know a vast before you go out. You soon learn things here. Boys think it " would be so pleasant to come and get money, but it would vast better for them to stay at school." (No. 222.)

I have the honour to be,
Gentlemen,
Your obedient servant,

Lincoln's Inn, 29th April 1865. J. EDWARD WHITE.

EVIDENCE upon the GLASS MANUFACTURE, collected by Mr. J. E. WHITE.

The Glass Manufacture.

Plate Glass

Newcastle-on-Tyne.

Mr. J.E.White.

q.

PLATE GLASS.

Messrs. R. W. Swinburne and Co.'s, Plate Glass Manufacturers, Newcastle-on-Tyne, and South Shields.

1. The two branches of the manufacture, viz., the making or casting the plates and the polishing them, are at present carried on in distinct works. Some small cog-wheels in a polishing shed which are low down and uncovered, look dangerous. Indeed they have been proved so (No. 6).

2. *Mr. R. W. Swinburne.*—We have two manufactories, one in South Shields, where the glass is founded and cast, the other in Newcastle-on-Tyne, where it is ground, smoothed, and polished. The casting begins at the same hour every day, viz., 4 a.m., and finishes at about noon the same day. The previous process, viz., founding or melting the metal, takes about 12 hours. The time occupied in founding crown and sheet glass, which we used to make, but do not now, was very uncertain, varying sometimes as much as from 16 to 20 hours, but with plate glass we have been able to secure regularity. Only men are engaged in preparing the materials, founding, or casting, but we have some boys in our South Shields works, apprentices from 15 years upwards, who cut and pack the glass. Their work is regular from 6 a.m. till 6 p.m. (At the South Shields works I was informed that two or three boys come on with the casters, and work from 3 a.m. till noon. Also that the whole process of founding and casting was completed exactly in 24 hours to within a few minutes.—J.E.W.)

In our Newcastle manufactory the stated day is from 6 a.m. till 6 p.m. I have a strong opinion that those are the right hours of labour on moral grounds. Indeed on every account we dislike working longer; and I hope that when we have more perfect machinery, as we shall have shortly, we shall be able to do without it. But hitherto we have been not unfrequently forced to work till 8 p.m. or so. Breaking down of the machinery, which very often happens, especially if machinery is old, is a common cause of this.

When very busy, we have tried working day and night by means of relays, but it does not answer. The machinery will not stand it properly. Besides, when the work is finished by one set of hands, one man is responsible for its being done properly; but if one set leaves and another comes on, the responsibility cannot be so well fixed.

Most of the boys are employed in attending the grinding and the polishing machinery, throwing on sand and water for the former, and wet rouge for the latter. They have no stoppage for meals, but get them as they can. If the machinery stopped for meals there would be a loss of time when work began again, owing to the temperature having been somewhat lowered. A warm temperature is required, and it is found that the work goes on more quickly and better at the end of the day, owing to the increased warmth. Also, if the machinery stopped, the sand or the rouge, as the case may be, would stiffen, and at starting again would scratch the glass. This would not matter in the grinding, but in the polishing, which is the last process, it would be an injury.

We do not like to take boys under about 11 or 12 years old, but some come younger, and it is, I think, better for them to be working than to be merely about the streets. Parents will send their children out as soon as they can get anything. Boys are very troublesome, and we tried to have men instead, but found it too expensive.

The smoothing, which comes between the grinding and polishing, is done by women and big girls, say from 15 or 16 years of age upwards. Some smooth with the hand, others attend smoothing machinery. These, however, all stop for meal times. Their time of work is nominally from 6 a.m. till 6 p.m., but it is rather at their own choice, as they are paid at the rate of so much a foot. They are glad to stay till 8 p.m. when they are wanted. Their work is dirty, and they keep working dresses for it, but there is no occasion for it to be wet. I am very particular about that. They keep sweeping off the wet with a scraper. The floor is dry.

We have have lately closed on Saturday at 1 p.m. instead of at 4, and think that we do not lose much work by it. I am a great advocate for paying early, and letting the hands go, particularly women. They can thus market with advantage, and have time to clean up their homes and be ready for Sunday.

We have very few accidents, not one in twelve months; never anything fatal, seldom anything more serious than flesh cuts from the glass breaking.

One part of our work is of a kind which requires care and cleanliness and good ventilation, owing to the mercury used for it, viz., silvering glass for mirrors. This is done by men only, but a few females work with them, cleaning the glass before it is silvered. It is very difficult to get the men to take care of themselves, *e.g.*, they will eat without washing their hands. A physician who visited this department of our work upon a Government medical inquiry, expressed himself as pleased with the airiness of our room in which this work is done. Silvering glass is a trade carried on in several places in London.

It would materially affect us if we had restrictions like those of the factories. The foreign competition is so very strong, and the advantages of foreign manufacturers so great. In the plate glass trade working through Sunday, as the French do, is a great advantage. Our work stops for Sunday, except the founding, which employs only a very few men. I believe that in France the grinding, &c. stops at 2 p.m. on Sundays, and that some holiday is allowed on Saturday.

Other advantages of foreign glass manufacturers in respect of cheaper wages, &c. are referred to in my paper read at the meeting of the British Association, held here in 1863. They employ women for parts of the work done in England only by men. The French sheet glass makers also work far harder and longer than the English, and they find it in consequence so exhausting, that in France it is said that they do not work beyond the age of 40.

Still long hours are not desirable, and I should like to see a law passed that no person should work more than 14 hours in a day, with a clear 10 hours for rest, and I think that no manufacturer would object to that.

The Glass Manufacture.

Plate Glass.

Newcastle-on-Tyne.

Mr. J.E.White.

q.

3. *Robert Buckham*, age 12.—Mind polishing machinery. Work from 6 a.m. till 9 p.m. Have done so all the time that I have been here now, *i.e.* six months. Worked here once before, and then worked from 6 a.m. till 10 p.m. all the time. It was for several months in last winter. All the lads at polishing work the same time. We have no meal-times. Get a bit as I am doing now (4 p.m.), but have to watch the glass all the time, and when it gets dry, put on some more polish. Get 5*s.* 10*d.* a week. 4*s.* 6*d.* would be the regular wages without overtime, *i.e.*, working only till 6 p.m.. When we worked till 10 p.m. it was 6*s.* 3*d.* Get very tired; it is in the arms chiefly, from pulling the bench on and off. Have never seen a lad hurt on those cogs.

Can read, not very well. Go to church.

4. *Thomas Melburn*, age 10.—Same work. Begin at 6 in the morning and give over at 9 at night. Do not stop for dinner. Only been here a week, taking another boy's place.

5. *John Summers*, age 11.—Mind a grinding bench. Work from 6 a.m. till 8 p.m. Have done so all the time that I have been here, *i.e.* six months. Have no time for breakfast or dinner. Have to heave sand on the bench, get a bit (*i.e.* of food), then heave more sand on, and so on. Sometimes a boy comes and takes my place a bit while I eat.

6. *Thomas Lister.*—The grinders generally work till 8 p.m., the polishers till 9, sometimes till 10. The polishing is usually later than the grinding. Neither polishers nor grinders have meal times. From morning till night neither can get out of the works. They can just get a run in the yard if they like. There are about 50 boys from 10 year old upwards employed in grinding, and 20 in polishing. The polishers get 4*s.* 6*d.* a week and the grinders 5*s.* When boys get to 15 or 16 they leave this work and are taught cutting.

The rouge used in polishing cannot hurt the boys; it's all the long hours that do harm. The grinders get wet at the knees. They could not wear aprons, because of the machinery; they would get caught.

The cogs in the polishing machinery are left uncovered, because they want oiling several times a day. The under part is only oiled twice a day. Boys are not allowed to do the oiling; a man does it. One boy lost his arm in those cogs, another his leg, but they were playing.

About 50 women and girls, seldom any under 16 years of age, are employed in smoothing. It is all piecework, some done by machinery, some with the hand. Sometimes about Friday, in order to get out their week's work, some work during the dinner hour.

I do not know if any of the boys go to school, but many can read. I know this because I give tracts, such as the British Workman, &c., which a lady brings to many, and when I go round the works, as I generally do two or three times a day, I see boys reading them.

[This witness was the person appointed to conduct me round the works.]

7. *Julia M'Anally*, age 18.—Work at smoothing here; have done so a year and a half. Our hours are from 6 a.m. till 6 p.m. with half an hour for breakfast and an hour for dinner. Sometimes work till 8 p.m. It's very seldom that I work the dinner hour.

London.

THE THAMES PLATE GLASS COMPANY'S WORKS, BLACKWALL.

8. *Mr. Thomas George Thorne*, manager.—There are two chief departments of work here, viz., the making the glass, and the polishing it,—including in the latter term the grinding and smoothing. There are also other miscellaneous kinds of work incidental to the business. All employed in the glass-house or glass-making department are men, with the exception of about three boys, who help them in odd ways. The glass-house day is from 6 a.m. till 6 p.m. or more often till 5 p.m. There are of course men during the night attending to the furnaces. This period is pretty regular, though things may at times happen to somewhat delay the founding.

Just about a third of the boys are employed in the grinding, and another third in the polishing, and the remainder in miscellaneous ways, *e.g.*, as a sort of apprentices to millwrights, blacksmiths, carpenters, &c., of whom we are obliged to employ a number in the works. These work the hours usual in the same trades elsewhere. The grinding boys merely throw sand, and the polishing boys crocus, on the glass, the grinding and polishing machinery being in other ways self-acting. There are also a number of females all working as smoothers, but most of them are women or nearly so. Any younger are working with their mothers or sisters. Smoothing is an intermediate process between the grinding and polishing, and is done by rubbing one plate of glass on another with emery between, and either by machinery or with the hand only.

All who work with the machinery, whether as grinders, smoothers, or polishers, are paid by the piece, and not directly by the company. A certain amount is paid to the foreman of each workroom, according to the amount of work done by it, and this money is divided out by him amongst the workers in the proportions arranged amongst themselves as proper. The hand smoothers are paid by the company. Where a girl merely works as helper under another, the latter receives the pay as one worker.

The regular day for these hands, viz., grinders, smoothers, and polishers, is from 6 a.m. till 6 p.m. and till 2 p.m. on Saturday; with two hours off for meals. The working hours, however, vary with the state of trade, from 48 to 78 hours per week. For nearly a year past, they have been from 6 a.m. to 8 p.m., and I hope that they may not again fall so much as they have done below the proper amount.

The females go away to their meals at the stated times, viz., 8, 12, and 4 o'clock if they like, but many of them live at a distance, and I should say that not a third do go out. There is a cooking room provided where they and the other workers can have their coffee, food, &c., got ready. Some eat there, some in their work sheds. The boys perhaps do not get their meals at the fixed times, but arrange amongst themselves as to when they can take them, say by getting others to mind their work while they do so. But they may take the full meal times, and I think do.

The machinery runs the whole time. It would be a serious loss if it did not do so, but had to stop for meal times. The loss would be the loss of all that amount of time, and as so much less work could be turned out in a given time, the cost would be proportionately increased. There would not, I think, be any injury to the glass itself, unless the machinery stopped long enough at a time to let the materials get hard and scratch the glass. An hour, I should say, would not be long enough to do that.

It would seriously affect the interests of the company if the manufacturing processes themselves were limited to the factory day, but if such a limit were applied not to the machinery or men, but only to the other workers, it would scarcely affect the manufacture. It would only affect the workers themselves, whose hours were so limited, as they would earn so much the less. As to children, we do not wish for them. The few that are here are brought in by parents or friends. Night work I do not like at all; it does not do, and we never practise it, or at any rate have not for a long time past. I except of course the furnace men, who must work by night.

All the work is healthy. The women and girls are a fine healthy set, and get good wages. Their work is good for developing their muscles, as they are constantly moving their arms. They may keep

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as dry and clean as possible at work if they like. Some do and some don't; it is just according to the individual. The rouge used by the polishers is harmless, and I never heard of any complaints being made of it. The only noxious substance used is arsenic, a small quantity of which forms one of the materials of the glass. The man who weighs out that has done it for many years. There is a sick club for the work-people, to which the company subscribes.

The company also subscribes to two hospitals, as accidents, chiefly cuts from breaking of the plates, are frequent. But there has not been a boy hurt by the machinery for a long time. There are very stringent regulations, and if a boy were found breaking them he would be discharged instantly. This was found necessary. Some years ago a boy was killed owing to his carelessness. He was scrambling across the machinery. (It was at rest at the time, but put in motion by another boy.—J.E.W.) Not long ago I turned away a boy because he was running a risk, and I had had to reprimand him for like carelessness before. The shafting is out of reach, and the cog-wheels are covered over.

There is no school in connexion with the works, but having boys taught is a point on which I think strongly, and as I have now just come to live close by the works, I hope that I may be able to see something about their attending some school, if there is any convenient; but it is a very out of the way neighbourhood. I think, however, that the boys have generally been to school before they came here, as if I ask for one who can read figures, &c., I have generally no difficulty in finding one.

9. *Robert Streeton*, age 11.—Have been a polisher here nearly six months. All this time we have worked from 6 a.m. till 8 p.m. It has been 9, and once so for two nights running. Don't get out from morning till night, except sometimes when my bench is off, or when we go errands for the men. Could just run outside if we wanted, only we are frightened the glass should break. Don't get no dinner hour; get dinner while at work, or sometimes some one comes and takes my place while I get it. Get 6*s*. 6*d*. a week.

Have another jacket and trousers, but no other boots. Clean the red off them. Wash the polish out of my hair with soap and hot water and soda every Saturday night, and wash it off my face every night. It makes the water red. Was one month at school; can't read.

[A bright, nice mannered boy.]

10. *Isaac Luck*, age 13.—Was six months here as polisher above a year ago, and came again to the same work three weeks back. All the time that I was here we worked, as now, from 6 a.m. till 8 p.m. Get dinner when we can, and breakfast too the best way we can. We sit down here near the benches, take a mouthful, and then run away. We are only outside when, say, we run for the foreman's dinner or that, perhaps five minutes.

Can read (only a few monosyllables). Was at school three years. Worked at rigging making, passing the ball, before I was here.

11. *Theodore Lewis*, age 13.—Heave sand on the plates in a grinding shed. Here nearly a year. Have worked all the time from 6.30 a.m. to 7.30 p.m. Get 6*s*. 6*d*. a week, and put 6*d*. of it in the bank.

Can read and write; was at school till I came here.

12. *Mary Lee*, age 12 years 11 months.—Work in a smoothing shed, rubbing with my hand. Have been here nearly a year. All the time I have worked from 6 a.m. till 8 p.m., except on Mondays and Fridays only till 7, and leaving early on Saturdays. It is hard work. Feel tired about Thursday, and my shoulders ache every night after I get home and sometimes while working. My feet and legs as far as my knees ache too. (Smoothers work standing.—J.E.W.) Work for mother (No. 13), who is in another shed. Don't know what she gets. She gives me 6*d*. or 1*s* a week. Think I am the youngest girl here. Can read a little; not write.

13. *Mary Lee*, smoother.—My girl (No. 12) has worked here nearly a year. It tires her back and feet and legs. A gentleman wanted her to go to the night school. She could go Monday night, and the foreman would let her go early for it on Tuesday night too, but she cannot go the school on nights which are later in the week, because we must stay to finish our week's work and earn the money.

14. *Margaret Titchell*, age 17.—Have worked here as hand smoother with mother nearly two years. Generally come at 6.30 or 7 a.m. and work till 8 p.m. Have worked the same all the time I have been here. Very seldom work in meal times, but do sometimes. Sometimes the work is very trying. Mother gives me sometimes more sometimes less; never 5*s*., I could not look for that; perhaps it is 6*d*. or 1*s*. in a week.

THE BIRMINGHAM PLATE GLASS COMPANY'S WORKS, SMETHWICK.

Birmingham.

15. The statements, Nos. 16 and 17, furnish the only account which I can give of these large works, the company considering that their mode of manufacture requires absolute secrecy. The account, however, is sufficient to show that the employments are of the same kind as those found in other plate glass manufactories, and so described.

16. *Mr. H. C. Lockhart*, manager.—Most of the boys, 46 in all, are employed in feeding the benches, on which the glass is ground by machinery, with sand and water, a work requiring constant attention, but not laborious. For this a boy must have the size and strength of an average boy of 12 years old; but they seldom stay more than two or three years, at the most four or five; and then, as the wages are the same for all without regard to age, viz., 5*s*. a week, and 6*d*. additional if they stay over the first year, they leave and go into ironworks or other employments where they can earn more. There is no work intermediate between that of boys and men, or in which they require training. The men's work, including the casting, is not begun under the age of 18 or 20.

Formerly a large number of boys were employed in minding the machines in which the glass is polished with rouge, but this is now done by men, one man being able to attend to four benches, each of which had a separate boy. We should prefer men for the grinding also, but each bench requires such constant feeding that there must be a man to each, and consequently the rate of wages would be increased without any saving in the number of persons employed.

From 130 to 140 females are employed in the smoothing, but as for this they must be tall and strong. Few, if any, come much under 18 years of age, and they run from that up to about 30.

About half a dozen boys work as apprentices in the cutting rooms, where the plates are cut with diamonds.

The casting is arranged so as to take about seven hours at a time, usually beginning at 6 a.m. This needs strength, and there is not more than one, if one, under 18 engaged in it. Overtime seldom happens. When it does, it is when there is a press of work, or to make up the time lost by the men taking a couple of days or so holiday at Easter, Whitsuntide, the wakes, and Christmas. But for the last three or four years the time has been short. We do not have a break down often, on the average not once a twelvemonth. There has not been one lasting a week for five years; one may last a week or two. The time for meals is not fixed, but depends upon the machinery, which stops at about breakfast and dinner

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time, and for about half an hour at one or two other times in the day, for relaying the benches with glass and oiling the machinery. The oiling is done by the men. A boy interfering in it would be discharged immediately. The meals are all brought and taken in the works.

There are five other plate glass manufactories in the kingdom, three at St. Helen's, one at London, and one at Newcastle, on the average of about the same size as this, one or two probably being larger and one or two smaller. In four of them in which I have been, the work was of the same kind, and carried on in the same way as here.

Though there is seldom occasion to exceed the regular hours of work, it would be inconvenient to be restricted in any way. The trade has suffered greatly of late by the introduction of foreign glass free of duty, while English glass cannot enter the continent freely in return, on account of the duties there.

The company subscribe to the evening schools, &c., round here, and support cricket clubs, one for the boys and one for the men. There are also music bands and a sick club, which is not much drawn upon; at least there is always a sum to be divided out at the end of the year. The boys have no occasion for a knowledge of writing or figures in the course of their employment. They are probably of the average class and mental condition of other boys in the neighbourhood.

17. *James Gibbs*, aged 14.—Have been five years in the plate-glass works at Smethwick, part of the time in a polishing shed and the remainder in a grinding shed. The hours were from 6 to 6, but nearly always in winter, as long as the cold weather lasted, we worked over till 9 p.m. Have worked nights there, days one week and nights the next, for six months, but none of us have done it for longer than that. The last three weeks (in summer) they have been working nights in one shop. I had just been shifted into that so that I might go on nights, but I broke my leg the day before. There are three grinding sheds, having in all 48 boys, and two polishing sheds, having 19, and four block-washers. The youngest that will be working nights now is 9 years old. My brother, now 16, has been in the works eight years, and a lad of 18 has been much longer.

We had no regular times for dinner, but had to get it as we could while the machinery stopped to oil the shafting and get the wheels ready, it might be a quarter of an hour, sometimes only five minutes, sometimes as much as half an hour, but they had to mind what they were doing to get as much as that. They oiled every six hours. There was no proper time for breakfast either, but we only had just what we could get while the benches were off.

The polishing was the easiest work, but the colour was bad. You were always red from the rouge. My brother has been red all the time (8 years). You got it into your mouth if you ate without washing your hands. The boys did not get hurt in the machinery, except one who got his foot "squeeged," but he was getting where he need not be. I only got my fingers cut, but never to hurt much.

[I found this boy a patient in the General Hospital.]

Crown and Sheet Glass.

CROWN AND SHEET GLASS.

Messrs. Chance Bros'. Crown and Sheet Glass Works, Spon Lane, Birmingham.

18. These are very large and important works, covering many acres of ground, and employing many hundred workpeople, of whom only quite a small proportion, about 300, are children and young persons. There are many separate glass-houses, most for making sheet glass, the others for crown glass, stained glass, rough plate glass, and optical glass; the latter, being a work which requires the highest possible skill, is carried on by adults only, and but very few of them. In the rough plate glass house none but men and three big boys are engaged. Stained glass making involves nothing peculiar as regards the character of the employment. The employment of boys under 12 in any part of the works is contrary to the rules of the firm, but it appears that it sometimes occurs. (Nos. 24, 25, 28, 29).

19. Boys are employed in grinding and polishing the "patent plate" glass made here, and females in smoothing it, in just the same manner as is done in the plate glass works. The smoothers, whose work is wet and sloppy, are provided with moleskin aprons, and wear high wooden shoes. They are said by this means to be able to leave their work sufficiently dry and tidy. A number of boys, about 30, are also employed in grinding light house glass. The machinery is of a different kind from that used in the "plate" grinding, but the nature of the employment is the same.

20. Great regard has been shown by the employers for the education of those under or around them. Large and handsome schools, including three lofty school-rooms, with class-rooms to each, supplied with maps, &c., and a house for a master, have been built by the firm close to their works at their own cost, which must have been very considerable. The benefit of these schools, though mainly intended for, is not confined to, those engaged in the works, for whom classes are held on three nights in the week, including instruction in drawing, which is of great use in certain branches of glass work, though said to be not yet so much appreciated by those who would benefit most by it here, as by other persons near who avail themselves of it. It having lately been thought by the employers desirable to ascertain the actual educational state of their younger workpeople, all have been examined; and the result of this has led to a rule that all under the age of 18 who failed to show the required knowledge of reading, writing, and arithmetic, shall attend the evening school.

21. A qualified surgeon is appointed to attend the people employed in the works, and has for the purpose a surgery forming part of the school group of buildings.

22. *Mr. William Davies.*—Surgeon to the Messrs. Chance's glass-works. I have been engaged as surgeon to these works for 19 years. From my experience there are no serious diseases peculiarly incident to the glass-work as carried on here. On the contrary, with reasonable care, and especially with temperance, I consider that it is as healthy as any employment. The men suffer most from their own intemperance, the heat and laborious nature of the work inducing them to drink largely.

I remember scarcely any cases of those diseases, such as colds and inflammation of the lungs, which would naturally be expected to be found where persons are exposed to great changes of temperature after severe labour in great heat, as those who work in glass-houses are; or rather, scarcely any which could be directly traced to this employment. I have found such diseases here in persons who were previously disposed to them, and have had to advise many to leave an employment which would be likely to be injurious to them.

I believe, however, that the glass-house people, who perspire a great deal at their work, and leave very much exhausted, would probably suffer, were it not for the great amount of rest which they have in the week and their living well, as their high wages enable them to do.

The most frequent complaint is that made by the

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polishers of having "got the rouge on their stomach." This is, I have no doubt, a correct account, as the rouge would pass through their nose and fall through the pharynx into the stomach, and when there, produce constipation, as any other such powder would. Those who work amongst the rouge do suffer from this, but it is not a serious ailment, and their own instinct leads them to ask for "opening medicines." This might, perhaps, be prevented by the use of masks; but it is not worth the trouble. Rouge consists of a common oxide of iron. I have not observed any bad effects arising from the use of emery; that is used wet, and would not be inhaled.

It is often asserted that dust inhaled acts upon the lungs; but I have never seen any evidence to satisfy me that such is the case. It cannot pass directly into the lungs, and I have not found any cases in which I could trace its action upon the passages to the lungs, so as to injure either them or the lungs through them.

Considering the large numbers of persons employed here, accidents are not numerous or serious. The most common are from cuts by the glass, either in the cutting or the polishing rooms, or from the bursting of the hot glass, or from getting into the cranks of the machinery; the majority of the cuts being in persons under 20 years of age, and the injuries from machinery being divided amongst men and boys in about equal proportions. Cuts requiring my dressing occur several times a week, almost daily; but they have never occasioned loss of life or limb, and the most serious have been divisions of the tendon, destroying the efficient use of the arm. Many years ago when, owing to a great and sudden increase of the works, large numbers of new and unskilled hands had to be taken in, accidents were very frequent; but in all parts of the work, out of doors as well as in, and not specially in the glass-work itself. Persons are much more exposed to risk from accidents when they are fatigued, and cannot command their attention equally. This is of great importance.

Sleep by day is not so beneficial for any one as sleep by night, even if it is equal in amount. Absence of light is essential, and the waste is not repaired in the same way. Regular rest is more important for the young than even for adults, and it should be taken without any break. No quite young person should have less than about eight hours of regular sleep.

23. *Joseph Withers.*—Superintendent of a crown glass-house, *i.e.*, of the hands who "work" the glass. This house is double, having two furnaces and two sets of hands. Each set consists of four gatherers, four blowers, two furnace men, two kilnmen, two punty men, and seven boys. The boys carry the pipes, each carrying two at a time. A pipe weighs 20 lb., and is difficult for any one, not used to it, to lift.

A full number of hours with a full set of hands is called a "journey." There are four journeys in a week, beginning at about 12 on Sunday night, 3 (6?) on Tuesday afternoon, 9 on Thursday morning and 5 on Saturday morning. The rest of the time is taken for preparing the glass, which is done by other hands (men). The boys work about 12 hours each time, having to come about two hours before the men to sweep up the house, clean the tools, and put everything ready for the men, so that the latter may begin directly they come in; but all, men and boys, leave work together. The work can never stop, as the glass would congeal. There is one stoppage such as that just now (It was scarcely noticeable, J. E. W.), when the fire is attended to, but it is not more than about five minutes. The boys can eat then, or "eat and walk." There is another double crown glass-house with the same proportion of hands, and the same system of hours and work in every respect.

When the boys first come to night work they cannot keep awake well, and fall asleep, but get used to it after a while. This is because they do not go to sleep in the day, but play about, as I did myself.

If it were necessary to have two sets of boys, arrangements could be made to do this without throwing the work out. Boys get 5*s.* a week at first, then 6*s.*, then 7*s.* To learn well they should come young, about 12 or 13. They work up through all the steps.

The work is healthy, but boys who used to cool the pipes by throwing water over them with their hands were always wet about the body from it, and complained of rheumatism. Also their hands were sore from being constantly in the water, which got burned by being used so often without change. Now, however, the hands are not used at all for this purpose, as water is turned on from a small pipe. This is a very simple plan, and might be used everywhere.

24. *William Hadley*, age 12.—Am a "pusher" in a crown house. I push a sliding iron door over the mouth of a furnace each time after the man has drawn the glass out. Stand close to the furnace to do this, but not in front. Have to draw into the corner out of the way of the glass and turn away my face as the man carries it past close to me. Have pushed for three years. Also carry away the pipe when the glass is taken off. Am always well, and can eat well.

25. *Henry Moss*, age 12.—Am "13 next April "fool day," (It is May) and have been here two years. "Push" like the other lad there, but am at other work now. (Only half the men are at work to-night.) When I first came I carried off pipes. The journey was 10 or 11 hours. Came this afternoon (Tuesday) at ½ past 3, but should have come at 3, only no one told me in time. The boys always have to come three hours before the men, to get ready for them. Will leave work at about 4 to-morrow morning.

At first used to go to sleep at night when sitting down at "pushing," about so far (8 or 10 feet) from the furnace mouth; not more than once in a journey. Was soon waked up, but was not beaten for it. Have seen a good many other boys go to sleep at their work. Get 6*s.* a week, 3*d.* of it for myself, when doing four journeys. Cannot read, but know my letters.

26. *John Smith.*—Superintendent of a sheet glass-house, *i.e.*, of the hands who work the glass. The founder and his crew of 6 men, with a boy to wait on them and open the door, prepare and melt the metal and have charge of it till fit to be worked. The founding may take much longer than usual, owing to wet or cold. The boy stays 8 or 9 hours, but the men's work being so heavy they work in relays, *i.e.*, in two sets of three each. The furnace is always burning except when let out for repairs, perhaps once in a couple of years.

When the metal is ready to be worked my work begins, which is to take the general charge of the metal in the furnace, keep it clean, and at the proper heat, and superintend my hands, about 50 in all, viz., 13 blowers, all men, 13 gatherers, all men, 13 pipe warmers, boys and youths of from about 14 to 20, and 10 "spare" boys, who wait on the men, carry their pipes to the pipe warming arch, carry water, clean the place, &c., and open the door.

The work of the "spare" boys is very simple, and such as a boy of 10, or 9, or 8 could do. All get as much as 5*s.* a week. No one works in a glass-house for less, except the founder's boy, who gets 3*s.* 6*d.* By about 14 they usually get to be pipe warmers, and gatherers by about 19 or 20, but some may get to the gathering by about 17. I did. A gatherer gets about 1*l.* a week. A pipe warmer puts a piece of hot glass on to the end of the cylinder formed by the blower and cuts it off, and occasionally takes the blower's place at the furnace for a short time to keep the metal in shape while the blower is away. Gatherers collect the metal from the furnace on a pipe for the blower. Boys coming young learn the work and get practice, moving up through its different parts. Men would not come for the wages which the boys' work pays, but the trade may be learned by beginning at any age up to 20. I would engage to teach it in 6 months, and could name a case of a young man who began at 20 lately. It sometimes happens that a dull scholar does his work better than one who is a better scholar, but that is the exception; and as mere workers I would much prefer

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intelligent and well taught boys to boys untrained and ignorant.

Our week's work consists of four journeys, on the average about 9 or 9½ hours each, occasionally 10, but not more. But the spare boys stay longer, on the average about 10½ hours, sometimes 11 or 12, and it has been as long as 12½ hours. If the wind is high it causes such a strong draught as to heat the furnace and metal too much for working, and the work is hindered. A wind may cause a delay of an hour and a half. This cannot be prevented by any appliances for keeping the wind off. Screens are put up for the purpose, but they cannot entirely exclude the influence of the wind. This is the only thing which lengthens the actual glass working. The cold and wet only delay our beginning by lengthening the founding process.

But there is one thing which occasionally throws on all, the founders' crew as well as mine, except the "spare" boys, who are not strong enough to help, a great amount of very heavy extra labour, viz., pot setting. This is necessary when a pot has broken, which happens in the founding when the heat is greatest. Sometimes there may be six or eight weeks without a pot breaking, sometimes it may happen several times in a week. Last week out of the eight pots in this furnace four broke. The whole pots are first worked out, and then all hands get out the broken pots, breaking down the side of the furnace for the purpose, and put the new pots in. This is the severest and most disagreeable work that we have, and may take two, three, or four hours, according to circumstances.

There is always a rest in the middle of our journey. Four of the eight pots are worked together, and when these are finished the remaining four pots are got ready by taking away the doors and removing the stoppers, which block up the openings to them, and skimming off the top of the metal, which is my work only. As soon as ever I can get it finished work begins again directly, but the stoppage is always as much as 30 minutes or from that to 40. In this interval a meal can be taken. A glass maker must live well. The men drink a good deal of ginger beer, &c., or whatever is brought to them, and the boys generally drink with the men and have whatever they have.

Accidents from burns and cuts happen in the course of the work from getting in the way or from the glass bursting. Last week a pipe warmer, a boy of 16, had an accident which looked frightful, though fortunately he was not seriously hurt. He was in his proper place by the glass blower, but stepped out just at the wrong moment, *i.e.*, as the glass blower was swinging the glass, which struck him in the face; but he escaped with cuts. Just now a boy, who has lately begun pipe warming, tumbled into the sunk place beneath the blower in which the glass is swung (several feet deep), but he was not hurt. Cuts are generally upon the hands, and burns upon the arms, that being about the height at which the glass is carried. They are not hurt very seriously, but are sometimes away for two or three journeys or so.

The system of work and the number and proportion of hands in the other sheet houses is just the same as in this.

27. *George Fenton*, age 18.—Am a pipe minder, but have not done it for very long, though I have been here four years. The boy who did it before was younger. Stand in front of the arch, *i.e.*, a furnace with a long row of holes, through which the ends of the pipes are heated, and move the pipes about so as to keep them at the proper heat. "Sometimes" it is very hot.

Can't tell for regular hours what my work is. It's all hours. Properly begin at 12 o'clock on Sunday night, 6 o'clock on Tuesday evening, 4 o'clock on Thursday afternoon, and 6 o'clock on Saturday morning, and each time work for 9 hours, making four journeys a week. Stop for half an hour in the middle of each journey.

[I was obliged to give up any further questions to this witness, finding that, though he apparently attended to his work just the same as before, he was becoming exposed to loud and increasing complaints from all quarters for his inattention in letting the pipes get too hot. The heat in which he stands is considerable.]

28. *Edgar Goodyer*, age 14.—"Spare" boy. Here three years. Carry pipes from one place to another as wanted. We work all hours. Can't tell you when we got to come. Have to come and find out, and when some one has found they tells you. Used to go to the school, and was in the third class, but don't go now. Can't read so very well; can write pretty tidy when I've got a copy. Have one by me. Do addition and odd sums, you know.

[The last two boys are in a sheet-house.]

29. *William Bayley*, age 15.—Now at the Crown iron works, Smethwick. Was in one of the crown glass-houses at Chance's, Spon Lane. There were four journeys a week, usually of 12 hours each; but we boys were always obliged to go about 3 hours before the men to call them, to clean up, get water, &c., so that we were usually 15 hours at a time there. I and two more lads had to call up about 15 men at their homes. On Sunday night we went at about 12; went to call the men at about 2 or so, and they began work at about 3. We had one meal in each journey, stopping for about half an hour when two of the four pots were finished. One of the boys was about so high (very short), and not more than 8 years old. He had been there a good while before I went there. He worked the same hours as the rest.

My work, carrying pipes, was not very hot. I was never poorly, and could work well. Was there two months. Wish I could get another job there. Did not get burned there, but sometimes the boys got burned and cut with the glass, and had to go to the doctor. One lad cut his knee, and had to play for a week for it. The men used to knock us about on the shoulders and head with their hands; sometimes with their fists.

Left day school at 9 years old. Could write a bit then, and read. Could have read that verse (stanza shown) without stopping, but cannot tell all the letters now. Was never at a night school. Go on Sunday. Have not been for the last three Sundays, and never go for a month without missing.

30. *Edward Field*, age 14.—"Spare boy." Go errands for the blowers, fetch their meals, &c. To night am carrying pieces (cylinders) for two men into this building (store). Each weighs 19 lbs., and I carry two at a time, and have to carry 200.

31. *William Tredwell*, age 17.—Push "slides," *i.e.* cylinders, through the opened door into a furnace, in which they are opened out into flat plates by a man. Have done this for three months, and was 5 years grinding the light-house glass.

My regular work is three days and two nights, each of 12 hours, in the week. Came this evening (Tuesday) at 6, and will leave at 6 to-morrow morning. Only stop for the "teasing," *i.e.*, when the cokes are put in. That is done about three times in the 12 hours, and takes about a quarter of an hour each time. Have my meals brought to me here.

[This is work which it is said that a younger person could not well do, and, of course, hot. The witness was eating bread and meat at his work, at about 10 or 11 o'clock at night.]

32. *John Lunn*, age 12.—Grind light-house glass. Mind the machine in which the glass is placed and spins round, and put on wet sand as it is wanted with a small wooden scraper. Get my breakfast and

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dinner as I can, by asking another lad to mind my machine. Generally get my dinner between 12 and $1\frac{1}{2}$ p.m., not later. Leave at 4 on Saturdays. Have not got hurt in the machine, or seen others hurt.

> [While I was speaking to this boy he hurried away to mind the machine of another boy who was having dinner towards midday.]

33. *Martin Connor*, age 14.—Mind a patent plate polishing machine, and have done so for nine months. If a plate breaks I lift up a weight placed over it and pull out the table on which the plate is placed. Do this without stopping the machine, which moves a number of other plates at the same time. There are four other boys who go round and watch the plates, but they cannot lift up the weights, and they call some one to do so.

We work from 6 a.m. till 8 p.m. on four days in the week; from 6 till 6 on Monday; and from 6 till 4 on Saturday. We have breakfast and dinner, about half an hour at each, when some one comes round and takes our work. The same man always comes to take mine.

34. *Samuel Evans*, age 13.—Don't know how old I am. Think I am about 13. Work in the assorting room. Hours are now (May) 6 a.m. till 6 p.m.; in winter, 7 a.m. till 5 p.m. In winter used to have only a quarter of an hour for dinner. If I work my dinner hour I go home at 5.

Was never at school except on Sundays, but am now obliged (by the employers) to go three nights a week from 7 till 9. Have only been here three or four months.

> [The dinner hour was said to be thus shortened in order to gain daylight, which is needed in this department. The boy is slow and ignorant. A boy, age 16, who "squares off" panes of glass with a diamond, can read easily, write, and do compound division; was examined here, but has to go to the evening school.]

35. *John Ward*, age 13.—"Lay on" sheets of glass on a bench for a man. Read (imperfectly), write in a copy book, and do multiplication. 7 times 7 is 14,—is 42,—is 49. Counted in this way, "Twice 7 is 14; three times 7 is 21," and so on.

36. *John Morris*, age 12 (?)—Do not know how old I am. (Looks 11 or 12.) Pick lumps of coal at the wharf and sweep. Before that used to "screen" coal. Hours are 6 a.m. till 6 p.m. always in both summer and winter, with half an hour for breakfast and an hour for dinner. A bell rings at these times. Have my meals here by the coal. Have been at school on Sundays for two months, but to no other. Know "A." "D" is "A," also.

37. *Julia Riley*, age 14.—Smooth glass by rubbing with the hand, and have done so for three months. It is very wet, but I wear clogs and an apron. The clogs keep my feet dry, but sometimes my skirts get wet through my apron. The apron is found for us by the manager. Hours are $6\frac{1}{2}$ a.m. to 6 p.m., with $\frac{3}{4}$ of an hour for breakfast and an hour for dinner. Some have these in the workshop here, others in the cook-house.

38. *Marianne Edwards*, age 15.—Clean sheets of glass with rags and brush off the enamel when dry to make the pattern. Work piecework and do so many sheets, as four or six, but my general time of working is from $8\frac{1}{2}$ a.m. till 6 p.m. Have breakfast before I come, dine either in the workroom here or going home, but as soon as I have done it I go on at work again. Shall get 8*s.* this week, but never got as much before.

Go to Sunday school. Was at many day schools till two years ago, when I went out to work, but never to a night school. Reads "go astray," &c. That means "running away."

> [Is hoarse.]

39. *Mr. James Jones.*—Am timekeeper for 400 persons in different departments, a small part only of the hands. Go round several times in the day to see who is absent, and keep account of the overtime where it is not kept by the managers. The people do not work overtime according to their own pleasure, but only as they are required. The day's work is $10\frac{1}{2}$ hours, but overtime, *i.e.* work done after 6 p.m., or in meal times, is reckoned as if the day were 8 hours only, and when only a quarter of an hour is allowed for dinner a whole hour's overtime is reckoned. Those who live near are supposed to go home to dinner, others eat anywhere. There is no regular room for meals, though some go to a room sometimes. All are paid by the firm. The hours vary very little through the year, but it all depends on the orders. On Saturday the clerks leave at 2 p.m., the people who work their dinner hour leave at 4, and the rest at 5.

Stourbridge.

THE STOURBRIDGE CROWN AND SHEET GLASS COMPANY'S WORKS.

40. It was with difficulty that I could remain a few moments before the mouths of the furnaces where the little shovel-holders work, holding shovels to screen the heat from the hands of the men, to enable them to gather the metal. They appear however to become habituated to the heat, as I noticed some standing at only a few feet distance from the furnaces, in very great heat, even when not required to do so by their work. But bad effects on health are traceable.

41. *Mr. Williamson*, manager.—We cannot do without boys at night, because it is impossible to fix the hours for beginning each journey. There are two houses, and it is arranged as near as may be that work shall begin in one when it ends in the other; the second set of hands starting their journey on Monday morning soon after the first finishes. Founding the metal usually takes about 18 hours, but it may take two or even four more. It would be possible to secure regularity to a greater degree by improving the furnaces and getting better currents of air, and taking care to have only good coal, &c. But pots might go, and that wastes a good deal of time, as any that are broken have to be taken out when the whole pots are worked out, part of the furnace having to be pulled down for the purpose, and new pots put in, at which the hands may be kept four hours. We have perhaps one or two break in a fortnight. It is true that care in securing good pots prevents this risk to some degree. I cannot tell whether we shall ever make crown glass. There is not much call for it now. Young boys of 10 or 11 do not suffer so much from the work as elder boys of 15 or 16, because they are shorter, and they are below the holes of the furnaces, while a taller boy would have his head and body more opposite to it.

42. *Edward Powles*, age 11.—Hold the shovel at the furnace, and also the "jigger," a small trough of water with holes at the bottom, to cool the pipes. Have done so for three years. Have four journeys a week, each lasting 9 or 10 hours. The first begins at about 12 o'clock on Sunday night; the next on Tuesday afternoon; the third on Thursday morning; and the last about the middle of the day Friday. But we always come before the men, sometimes as much as three hours, to get the water in and the things ready for the men; and stay after they are gone to put things away, but not above half

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an hour. Come at 9 on Sunday night. Usually get four nights' sleep in a week; but have worked 18 and 20 hours together, when taking another boy's place in the other house, and have worked two journeys over in a week in this way. A good many of the other boys work over too, which is wanted if there is a boy short. Like working over, because I get 1*s.* 3*d.* each journey over for myself; but none of my regular wages of 5*s.* a week.

Have the headaches very much, and most when working two journeys running. Sweat, too, very much, and have to wipe me. They don't let us stop at all in all the time; we eat, but we has to work. They make us work on, and get our victuals as we can, which we do with one hand, while we hold the "jigger" to cool the tools with the other. We never stop, but there may be breaks of not perhaps half an hour altogether in the whole time.

Got burned five or six times when I first came, from getting in the way of the gatherers who shoved the glass up against me. It burned my clothes and made them flame a bit. Twice I was burned badly. The mark on my hand is where one of the boys dropped something on it. Have very often had my clothes burned. Have got my hands cut from falling on the glass when knocked down, and have cut my arm from tumbling on it when I have been carrying something. There is broken glass on the floor, and when there is a good lot they often make us work a day and a half at clearing it up.

Cannot read. Never had much schooling, though I have gone there for a good bit; but I was so often fetched away for work. Never go to Sunday school now. Left because I have to come to work on Sunday night, and go to bed at 3 in the afternoon to be ready for it.

[A sharp, well mannered boy, lively and cheerful.]

43. *George Brookes*, age 13. — Same work and hours as last boy. Two boys younger than I am hold the shovel in here and another of 15. I work for six men. Came this morning (Thursday) at 8. Had something to eat at 1 and 4 a.m. on Monday, and do about the same in each journey; but you have to get it when you can, as the men don't stop the while. Sometimes you get a minute or two, sometimes only a second; get a mouthful, have to run back to work, then perhaps get a second or so again. Can eat better at home than here. Get meat three or four times a week. Earn 5*s.* a week.

Have headache very often, but more of late; not so much when I first came. Am never more than two days without it; have it most when here. Have not one now. Am giddy sometimes with it, but never tumbled down from it. Am tired when here by nights, but not at all by days; don't feel faint at night. Drink water and tea that mother sends me. Am bad in my breast, and short winded, and have a cold there which hurts me; and sometimes I have to be away from work. Have not been strong all the time I have been here, 14 months; but I was always bad in my breast as a little boy.

My hands get sore sometimes from the water out of which I have to take the jigger to hold it up. When the water gets too hot I call the "teaser" to change it. When I am heaving the jigger, the hot pipe sometimes knocks against my arm and burns it. The burn on my chin is from a hot iron which one of the men pushed at me to frighten me. My little brother, 10 years old, has got two burns now. For one he gave over half a journey, and the doctor belonging to the works dressed it. Sometimes we get burned by running against the glass. I have run against it with my stomach. Another boy, about my age, ran against some with his breast, and set his shirt afire, and burned his breast. It was against a piece of 21-inch glass, the usual size (which weighs 13½ lbs.)

Cannot tell the letters. Was at a day school for five years, and paid 2*d.* and 3*d.* a week. Don't go on Sunday. Three times 7 is (after about 30 seconds pause) 21. Ireland is a little town. Don't know what London is. Think it is a little town; can't say whether it is bigger than Birmingham. The Testament is a book about God. Have heard of the Garden of Eden, but forget about it now, or whether it is a nice place.

[Languid and oppressed.]

MESSRS. JAMES HARTLEY AND CO.'S CROWN AND SHEET GLASS WORKS, SUNDERLAND.

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44. *Mr. James Hartley.*—After the Messrs. Chance of Birmingham, we and the Messrs. Pilkington, of St. Helens, in Lancashire, who are on about the same scale as ourselves, are by far the largest manufacturers of crown and sheet glass in the kingdom. There are only four other firms, one in Wearmouth, near here, one at Stourbridge, one at Nailsea, near Bristol, and another in Lancashire; the four last having about two glass houses each. We have 10 glass houses, nine for crown and sheet, and one for patent rolled or rough plate glass, and we employ between 600 and 700 persons. Crown glass has been to a great degree supplanted by sheet glass everywhere, and is fast going out. As far as system and kind of employment are concerned, one of our houses here for all practical purposes represents all others in the kingdom in the same branch of the glass manufacture. The crown houses have four blowers each, and the sheet houses about nine each, *i.e.* a blower for each pot. Each blower has a gatherer, in most cases an adult, and a boy; and each house has about three boys who do odd work, *e.g.* shovel holders, &c. There are two or three other men but no other boys in each house. This is of course exclusive of the persons employed in preparing the metal for working, who are all men.

Four meltings of metal are prepared and worked out from each pot in a week, each taking for the whole process a period of about 42 hours. Of this, towards 24 are required for putting in the metal and founding or melting it, and about eight for allowing it to settle so as to be fit to work; so that, supposing things to go on well, there must be an interval of of about 32 hours between each period of working the glass. From delays, however, there is often more. The actual period of working out the metal is from eight to ten hours.

Accidental delays prevent these periods or journeys beginning at uniform hours, but it may be taken that if things go well, and on the average, a third of the first journey is night work, the second all night work, the third half night work, the fourth all day work. All begin at 12 o'clock on Sunday night, or as near to it as possible. Any delay in the commencement of a journey takes so much from the amount of work which can be got out, as the remainder of the week is only just sufficient to complete four whole journeys even without delays. We think that we do exceedingly well if we finish four complete journeys by Saturday night. On the average we finish by 6 p m., on that day. We must do so to allow of beginning the next week at the proper time.

Formerly only three journeys a week used to be made, and of longer duration; viz., 12 or 14 hours of each. The change was made when the duty on glass was taken off. The effect of taking off that was to increase the quantity of glass which we produce in an extraordinary manner, the price at which we sell to the consumer being, of course, reduced in proportion. Where we made 20 tons we now make 100, *i.e.*, in a week. This is owing not to the number of journeys being altered, but to the increased consumption and appliances.

We are never likely to make more than four journeys in a week. To make six is of course an object at which we are constantly aiming, but we see no prospect of it yet. We should be only too glad if we did. There would be no medium between six and four journeys. We should not make five. As far as reducing night work is concerned, with five journeys there would be more night work than with four. It is probable, however, that the men could not work more than four journeys of the present length well.

Belgium and France are the two chief countries out of England in which sheet glass is made. Probably half the sheet glass used in the world at large is made in Belgium. The French make chiefly for their own consumption. On the continent the work is of the same kind and done on the same system, except that the pots used are smaller and the journeys more frequent; and also they work through Sunday. They work by the month instead of by the week as we do in England, making 20 journeys in the month instead of our 16.

Night work, as practised on the system of crown and sheet glass-houses, is not, in my opinion, injurious to health. The boys who work at all must work by night and day indifferently. There is, however, no occasion for our employing young boys at all. I should be glad if there were such a limitation, and have often thought that we might try to enforce this ourselves, but practically we cannot. Younger boys are brought in by parents or friends, and chiefly when the parents are of the lower class of men.

The maximum of age up to which boys could be excluded from night work, and therefore from all work, in glass houses, would depend chiefly upon the neighbourhood. In many places there would be no harm in fixing it as high as 15 or 16, and for our trade generally 14 might be fixed; but it would be necessary to compel the parents to send their boys to school till they come to work.

After all, however, the question of excluding boys under any given age is a matter which affects the interest of the parents and the boys rather than of the manufacturer. But the whole question of the condition of boys in glass-houses such as ours is of comparatively little importance, for in the whole crown and sheet glass trade in England there are not, I should say, more than 200 young boys, *i.e.*, say from the age of 11 to 14, employed in the glass houses.

We are very strict about the treatment of the boys. No man is allowed to strike a boy under any circumstances. We should immediately make the boy take out a summons and bring the man before a magistrate. Indeed we have made our own solicitor appear for the boy. If a man was struck by another man we should make him take out a summons just the same; but we have had no occasion of the kind lately, and I believe that in our houses the boys are all kindly treated and comfortable. A manager is moving about in each glass house all the time, seeing what goes on, and responsible for the conduct of the workers, and if the boys do anything wrong they are amenable to him alone.

Sheet-glass blowers too are a superior set, far above the class generally found in bottle or flint houses. The bottle trade is worse than the flint, I should say, as regards the treatment of the boys, and the men of a rougher class. The superiority of our men may be partly owing to the different character of the work, but I attribute it chiefly to the good system which we have established. We are obliged to keep up very strict discipline for our own interest, but it is a great advantage to the men themselves.

In particular, our strictness as to drink has been very beneficial. Of course we do not attempt to forbid a man getting what he pleases for his own use, but we give no allowances for drink, such as are often given in glass houses for various things, *e.g.*, setting a pot. The effect of these is to make men drink and to teach the boys also. Nor do we allow apprentices to pay "footings," or money paid on entering upon a new stage of work. We have another rule of great importance, viz., that no two or more men should join to send out for drink together. This prevents a man from being persuaded or bothered into getting drink merely to please others when he has no wish for it himself.

We employ a very few females in miscellaneous ways, *e.g.*, in helping the men make pots, in grinding glass, and also in staining or enamelling. Boys are also employed in cutting up the sheets of glass with the diamond. In the rolled plate-glass house there are only two or three boys.

We do not attempt to keep up any school for our boys, or to require them to attend any, which we should find very difficult, especially considering the system of our work; but we subscribe to the schools of every kind and denomination near us, as the simplest mode of doing something for education.

45. *Johnnie Mathers*, age 9.—Shovel holder in a sheet house. Have been here nine months. Don't know my birthday. Came on this morning at 10.30, and the men began working at a quarter to 2. Usually come three hours before the men begin work. Have to put the pipes up, call the men, &c. The men will finish about 11 to-night. (The manager stated that it would probably be about 12, it might be a little sooner or a little later.—J.E.W.) Stop about half an hour after the men leave to clear up, *i.e.*, if there are nae pots to turn. If they have pots to turn, which is once or twice a week, we have to stay longer to get bricks and dabby. Have not had a regular stop for a meal since I came this morning (it is now 5 p.m.). Have sat down about half an hour altogether. We are called at any hour of the day or night. The lads will be on about 13 hours usually, and the glass-makers 9 or 10. When I am off work sometimes I am sleeping and in bed, and sometimes get a play. Get 3*s.* 6*d.* a week. There is another boy a shovel-holder in this house.

46. *William Thomas*, age 12.—In a crown house. Hold the thimble, carry pipes, &c. Came this morning at 8.30, and shall give over at 11.30 to-night. The men did not begin work till 11.30. Usually come two hours before they begin, sometimes three. Have to put bars on, call the men, &c. Sometimes come at 11 p.m. and stay till 2 p.m. next day, or come at 3 a.m. and leave at 4 p.m. and so on. Have had three meals to day (it is between 5 and 6 p.m.) Don't stop work for them. Carry a pipe, then eat a bit, and so on. Haven't sat down to day an hour nor half an hour; just sit down about 5 minutes, then get up and carry the pipes off. Sometimes father, a blower, comes and carries them, for me to stop to eat. Never stop altogether in a journey unless the nose-hole is cold, *i.e.*, not hot enough for the men to work. The men are 12 hours working on a journey, not more, sometimes less, as 11 or 11½. After they stop it will be 30 hours before they begin again. Put my hand up so (to head) to keep the heat off. Must go now to catch punties; know I must because the boy is shouting out the tally (*i.e.*, the completion of a given number). Was only two or three weeks at day school.

47. *Solomon Spires*, manager of a crown house.—A journey usually takes 12 hours. The boys come two hours before the men; come when I do. They get the marvers ready, call the men, &c. We reckon that the men are 12 hours on and 30 off. The time between the journeys is usually from 29 to 32 or 33 hours. In nine cases out of ten the time depends on the effects of good or bad coal. Sometimes the wind is in favour of one furnace and against another. We have doors to turn the draught one way or the other, and sometimes have no doors open at all. If pots break it may take 33 or 34 hours between two journeys, and then when the men come on they have to work a shorter time.

The men are reckoned to make 600 in a journey. Our employer does not allow them to make less than 50 in an hour, but they are oftener under than over the 12 hours. Many times they turn out the quantity under 11 hours, but they are allowed 12.

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We make no stoppages in a journey. Perhaps the men may send a boy, a spare boy, for a pint. The men lie out by turns, say a gatherer and a blower at a time, for eating, but they do not give a boy the same privilege. The boys, however, have plenty of time to eat.

I was at the Messrs. Chance's works at Birmingham. This place is worked on the same plan as theirs, except that there are no "pushers" here, *i.e.*, boys to slide a door before the furnace. It is the old plan to do without these slides. It was thought that they would save the man and improve the work, but we can make as good work without as with them.

A pipe weighs about 16 lbs. It is rather heavy for a boy to carry. I have strict orders not to take boys too little. Mr. Hartley will not allow a man to lift a hand against a boy in here except me.

48. *David Robertson.*—I superintend in a sheet house. The sheet houses all work alike. The men's journey averages 8½ hours, sometimes it is 9½ or 10. The boys generally come three hours before the men, so as to get the pipes out, sweep the floor, put the bars on, call the men, &c. They might do all this in half an hour. They are called so soon and come when I do merely because it is the practice. We look for the work to average 12 cylinders an hour, but the time varies according to the substance, *i.e.* the thickness of the glass. The flatters work from 12 o'clock till 12. That boy (No. 45) was taken so young from mere charity. His father was killed in a colliery and his mother left badly off.

THE WEARMOUTH CROWN GLASS CO.'S CROWN AND SHEET GLASS WORKS, SUNDERLAND.

49. *Messrs. John Matteson, and C. Goulton Matteson,* managing partners.—Our work is of the same kind and carried on upon the same plan as that of the Messrs. Hartley here, (*details shewing this are omitted*). The first journey begins as soon after 12 on Sunday night as may be; 2 a.m. satisfies us; it may sometimes be an hour or two later. We must begin thus early, because if time is lost anyhow in the course of the week we cannot fetch it up. All this week we have been trying to make up time, but are still (Thursday) six hours behind. Sometimes work is not finished till 12 Saturday night, but we stop working the metal then in any case, whether the journey is completed or not, and leave in the pots any metal which is not then worked out. This shortens the following period of founding, as there is less fresh metal to melt. The other set of men come on at once then to prepare a set of metal for the Monday's working.

The whole period required for preparing and working out one melting of metal, may be put on the average at 42 hours. Of this two or three hours are taken for preparing the furnace, 20 for founding, 8 for settling, and 9 or 10 for working out the metal. The founding alone, without the settling, used to take from 36 to 28 hours and there were only three founds in a week. The time has been gained, to allow of the present fourth journey, by having larger furnaces and greater heat. The shortening of the time still further so as to allow of having six journeys a week has occupied our attention for many years, but we cannot see our way to it. The hours are much the same in both the crown and the sheet work, except that of the two, the working journey is rather shorter in the sheet. We have had crown journeys as long as 12 hours, but that was when we used to work all the metal out. It is better not to work it too low.

The number of hours required for preparing the metal, plainly will not allow of the work falling only in the day time. Besides this, accidents of several kinds, *e.g.*, breaking of pots, state of the wind and weather, carelessness in feeding the furnaces, and other circumstances which we cannot forsee or guard against, are certain to produce a considerable amount of irregularity. For instance, it would be impossible to foretell now at what hours of a given day or night we should be at work in two or three weeks time. It is known only from day to day. The manager of each house directs when the men are to be called, *i.e.*, as soon as ever he finds the metal ready. It may be at any hour of a day or night, but the workers will have some idea from the previous state of the work, and boys will be hanging about the day before, to find out when it is likely to be ready. All the workers therefore are obliged to live near. The boys are called an hour or so before the men, and stay a short time after the men leave work, say from 10 minutes to half an hour. Three boys have to go round and call the men, and are paid 1*s.* 6*d.* each a week extra for it.

The same causes which make it impossible for us to give up night work of boys would also make any regulation requiring stated meal times impracticable. As a matter of fact there is in most cases a stoppage in which a meal is taken. In the sheet glass work there is always a stoppage of, say three quarters of an hour, sometimes an hour, as near as possible to the middle of the journey, indeed barring casualties, exactly in the middle. While the work is going on, the man who blows, his gatherer, and his boy are going incessantly, and they need the interval for rest. The working furnace also needs to be restored by putting in more fuel. Neither the men nor the furnaces could get through without a stoppage. In crown glass the men's work is of a less incessant nature, and they do not find it necessary to rest so long. They stop, say, about half the time that the sheet glass makers do, and sometimes prefer to go on without stopping at all, or scarcely stopping. It is as the head man requires. But no stated time for taking meals could be named, and if a stated amount had to be given, it might cause the entire loss of work of that amount, *e.g.*, in case of the work being behind hand from delays, so that there was not time to complete the four journeys in the week. This must be done in order to produce the amount of work which will employ and pay for keeping up the rest of the establishment, which is more expensive even than the glass makers. These are paid by the piece, but the teasers, labourers employed in wheeling, &c., the sorters, cutters and others are paid by the week, and must have the full pay in any case. Anything therefore which tended to prevent the glass makers making the full amount of work in the week, would very materially increase the cost of production. If we had to leave, say, a quarter of the metal in each pot unworked, every journey, this would be equivalent to making only three journeys in the week instead of four. The metal itself is not injured by leaving, and some, about a fifth or sixth part, is always left in. It is true also that the subsequent, founding would occupy a shorter time, but more than three fourths. We could not put on more hands because there is not sufficient room for them to work in. We employ regularly just as many as we calculate will be able to get over the required quantity of work in a given time and no more.

There is a spare boy in each house, and he can take the place of the other boys when wanted, so that even if there is no regular stoppage, each boy in turn can get time for a meal.

The time lost in stated meals would also cause danger of diminishing in another way the quantity of work done. The furnaces will not maintain sufficient heat for working beyond a certain time, and the furnace containing the glass cannot be replenished during work. The blowing furnace, *i.e.* that at which the glass maker works, cannot be fired afresh during the time of working; it would spoil the glass; but it is replenished during the "stop." In England two furnaces are used, viz., the melting and the blowing furnaces. In Belgium, where one furnace is used for both purposes, viz., melting and blowing, this must be fired afresh during the period of working. But neither

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the quality nor the workmanship of the glass there, are to be compared with the English for goodness.

In the crown glass house a stated stoppage for a meal would cause a further difficulty. Each disc of glass directly it is finished, is put into the annealing kiln, and carries in a great amount of heat with it, the kiln man has to calculate how much. Thus, unless glass were continually going in or nearly so, there would be a risk of spoiling all the glass in the kiln, from being not sufficiently heated. The cylinders of sheet glass are not put into a kiln or annealing furnace at once, but are simply laid on one side for the time.

We do not like boys much under 14 years of age, but parents get them in younger, though frequently not working under themselves. Sometimes we have had to move a boy from working under his father, because the father seems to expect more of him than he would from a stranger, and to be too harsh. Parents will send their children very early, as young as they can earn anything. Practically also, boys do not get inured to the fires so well, unless they come quite young. To learn the work and to enable us to carry it on, boys should come not later than 15 or 16. We could do without boys under 12 or 13, without serious inconvenience, and prefer them not under this age, but not without boys under 18.

The cutters and other day workers work from 6 a.m. till 6 p.m., with the usual meals, and in winter from 7 till 5, with only 40 minutes for dinner. Sometimes they work till 8 p.m., but it is extremely rare.

We have made great efforts for the education of our boys. We found that there were on the average two clear whole days, and two half days, *i.e.*, equal to three days in the week, in which the boys were off work, and in which there was no reason that they should not go to the national school, which was mainly got up by a gentleman engaged by our firm; and we were willing to pay the expense to induce them to go. But the parents being very well off, we thought it better for each boy to pay 1*d.* a week, as the school would be valued more, and we paid the remainder. We requested the schoolmaster to report the attendance of the boys each week to our manager, but there were great practical difficulties. The schoolmaster complained so of the defective education of the boys, especially the big ones, and the boys had such an antipathy to going, especially the big ones, who felt ashamed of being in a class with little ones, that the manager found it more labour than he could undertake to keep up the attendance; it gradually fell off to two days, one and a half, and one, and finally to none.

The schoolmaster made representations to the school inspector that the boys were so backward, and came so irregularly, that they lowered the standard of his school, and the inspector came down and represented this to us. We then asked the master to take them at a night school, which he agreed to, but after a while said he must decline, as he found the hours too long. We believe that the real fact was that they were too old to learn what they ought to have learned when younger. So what to do now we cannot tell. We cannot get the majority of the parents to educate their children before they are sent to us. Many of the parents who earn good wages are sending their children to good schools in the town of Bishops' Wearmouth; these, however, are the minority. By 13, a boy ought to be able to read and write at least. Some here, we believe, can read. We have had cases, indeed, recently, where even the glass-house boys have shown remarkable anxiety to improve, and these we encourage and help. One in consequence rose to be a clerk in the office, and another a very good warehouseman. But such a desire for improvement is quite exceptional.

50. *Joseph Stanger*, manager of sheet glass house. —I am a Frenchman and have been in sheet glass works in Belgium. The system of work there is the same as in the north of France. Work is by the month, not by the week as it is here, and goes on through Sunday just the same as other days. Men work by the piece making from 85 to 100 cylinders in a journey, and 24 journeys in a month, each journey taking from eight to nine hours.

They do not employ so many boys in proportion as are employed here. The gatherers, who are grown up men, do what is wanted; they gather without a boy to hold the shovel for them. The pots are smaller, about half the size of ours, and the heat therefore less, but the men's faces get terribly burned. A shovel is a great protection. Nor are there pipe boys as here. They use only one furnace instead of our two, viz., a melting and a blowing surface, so that a gatherer has only to carry the metal about four yards. Where the two furnaces are used boys are necessary. Boys, however, are employed there in some branches of the work, as where heavier work is made, and these are brought on and supply workmen to the trade.

In foreign countries generally, *i.e.*, not only in France and Belgium, but in Spain, Prussia, and Switzerland, they work through Sunday in the same way. I have had a brother many years in a glass house in Spain. The work there is on the same plan as in Belgium. In Prussia two furnaces are used and boys employed the same as here. In all countries the journeys are about the same length.

Here each of the 12 sheet glass blowers has a gatherer and a boy to help. The boy puts water on the block, puts the pipes up to the furnace, gathers a little band of metal to be put by the man round the cylinder to separate the end, &c. The gatherer usually cools the pipe. One boy holds the shovel for four pots; it is not necessary for him to hold the shovel all the time, not till the metal is worked a long way down so that the gatherer's hands have to be put close in to the furnace. None of the boys here are much under 13 years old. They should not begin later than 14 or they would not make good workmen. Some begin to learn to gather at about 14.

Here we never begin work before 12 on Sunday night. If the metal is ready sooner, we keep it back the best way we can. We stop work on Saturday night anyhow.

Nailsea.

THE NAILSEA SHEET GLASS WORKS.

51. These are very old established works, indeed I was told, probably the oldest of their kind in the kingdom. They are peculiar in being in an entirely country district, Nailsea being a village several miles below Bristol. Their situation is probably owing to the presence of coal, as there appear to be several collieries in the immediate neighbourhood. The glass blowers were not yet at work at the time of my visit, a Tuesday morning, but the appearance of the few boys whom I found in the works was much more healthy than what I have usually observed in glass houses in manufacturing districts. One or two whom I questioned, had not begun glass-house work till a comparatively late age.

52. *Mr. S. Bowen.*—There are about 200 persons employed in these work, all males but one, and about 50 of them under the age of 18. We make four journeys in a week, both in the two sheet glass houses and in the rolled plate glass-house. In the sheet glass houses the journey for the men is on the average 10 or 11 hours, or if all the pots are in full work, it may be 12 or 12½ hours, but never more. The boys, however, come before the men to get the things ready, and so work on the average 13 or 14 hours in each journey. Each blower has a gatherer, who is a man, and a boy usually of from 13 or 14 to 17 or 18, who helps by carrying the pipes, holding them at the furnace, &c. The few youngest

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boys who are perhaps from 11 to 13 years old, are called spare boys, and hold shovels at the furnace to screen the gatherers. In the rolled plate house the journey does not average more than 9 hours. In that all but one or two are men.

The work falls about equally in the day and night. As near as any fixed time can be named, the first journey begins some time in the afternoon of Thursday, on which day our week begins, the second from midnight on Friday to 2 or 3 a.m. on Saturday, the third from midnight on Sunday to 2 a.m. on Monday, the fourth on Tuesday afternoon. The times of beginning, however, vary considerably, and the two sheet glass-houses are seldom together. The difference is caused by the delay in setting pots. It is quite a chance when new pots may be needed. A little carelessness in the men who have charge of the furnaces might spoil the whole set of pots. When the working journey has once begun it is not liable to be interrupted or hindered by accidental causes. The pots break only in the founding when the heat is much greater. The weather, unless it is very extraordinary, does not affect us. When the working has once begun it must be finished, or the expense of preparing the metal, which is great, would be wasted. Hence it has happened, but very rarely, only once or twice I think in the three years that I have had these works, that the glass blowers have been obliged to work on Sunday. As a rule we contrive to finish in good time on Saturday afternoon.

Besides the boys in the glass houses there are others, about seven of like ages, called "push boys," who push the cylinders into the kilns in which they are flattened out by men. They work from 6 till 6, days one week, and nights the other, except on Mondays and Saturdays. On these two days the two sets work less, dividing only 18 hours between them, viz., from 12 on Sunday night till 6 p.m. on Monday, and on Saturday from 6 a.m. till 12 p.m. They have usually no work on Wednesday night. A push boy could not properly work over to take the place of a boy in the other turn. Our loss would be too heavy to let them do so. They would be too tired, and if a boy broke even one piece of glass that would be as much as a good bit of his wages. Indeed in all parts of glass house work, the principal thing is to have a good supply of hands. Nothing is so fatal to a manufacturer as to be short handed. The workers will take advantage of it directly as an excuse for not working if a chance arises, so that it is necessary to have some surplus. A woman and a few boys help at pot making, and there is an engine for the clay mill.

The glass blowers stop about half-an-hour in the middle of their journey for a meal. The flatteners have no fixed meal times, but take meals when they stop to put fuel into the kilns, which takes perhaps a quarter of an hour or so three times in the 12 hours.

We could not possibly do without having boys to work at night with the men. It is not desirable that boys should come to work younger than about 12. The loss in increase of wages would not be serious if they could not come till they were 14, as the boys under that age are so few, but that would be going to the extreme limit possible. Even to do the work of a boy of 14 a boy should have been in the house a bit before. The gatherers here I believe are all as much as 18, but boys are learning it before; *e.g.*, before the men come, they gather some glass on the pipe to make the iron fit to begin work.

The English manufacturers are already at a great disadvantage as compared with foreigners. They have been over to France this year to try to get the import duty to France taken off. This presses very heavily upon them, while the French can send their glass here without any import duty. The Belgians, however, are the greatest sheet glass manufacturers, and owing probably to the greater cheapness of their labour, can send their goods and sell them here cheaper than we can possibly make them in England. In one case I found that they could supply at a 1*d.* what I could not make under 1½*d.*; and in another case I found a still greater difference. Since the American war has in a great degree cut off one principal market of the Belgian goods, these have come to England in still greater quantities than before.

Owing to these causes sooner or later there will certainly be a change in the English glass manufacture to enable us to meet the foreigners, most likely by making a lighter class of goods, and so employing younger boys. There is no doubt whatever about that; or at least that something to answer the same end will be done.

The English glass is far superior to the Belgian in quality. We work with two furnaces, they with only one, *i.e.*, for both melting and blowing. The two furnaces are of course a greater expense, but enable us to ensure purer glass. I have been through Belgian and French sheet glass manufactories.

It is quite a mistake to fancy, as some do, that there is anything unhealthy in glass making. The only thing to be noticed is the heat, and that is harmless. I believe that I may say that there is not one unhealthy boy in the works, and that is a great deal to say. I try in every way to make the work as comfortable and agreeable as possible, and particularly to see that the boys are kindly treated, as I feel sure that they are.

We are in a deplorable way in this neighbourhood for schools. There is only one at all near, and that under a governess and dwindling down. The mass here are rough and untaught, and this neighbourhood will suffer for it. The children appear to be taken but little care of and may be seen idling about in crowds. Yet the glass makers earn good wages, the blowers from 2*l.* to 4*l.* a week, and the gatherers from 24*s.* to 30*s.* If the Government could be got to make a grant towards schools I would gladly give towards the fund. When I am able I shall try to have some school in connexion with the works. The boys are very ignorant. That big youth there, who is about 20, I dare say cannot read or write. I also think of trying some way of getting any that I can to attend a place of worship; nothing would give me greater pleasure than to get them to do so.

53. *John Urch*, age 15.—Mind the pipes and blocks in a sheet house. Went to a sheet glass-house first at St. Helens (large works), and held the shovel when I was going in 8; was about 7 years and 6 months old. Father was a teaser there. The work and hours were much the same as here. The glass blowers worked about a ten hours in a journey, and we came about two hours before them. Had to hold the shovel as soon as ever a pot was started; did not wait till the metal was worked some way down. There would be three or four gatherers at a pot. Shovel holding was a deal easier than my work since, *i.e.*, minding pipes, &c., but warmer. There were several houses there and working at different times. Sometimes if a boy was bad in another house I would go and take his turn or part of it. Have gone six journeys in a week so. The most I ever worked at one time without stopping was 24 hours. Had no sleep in that time. After that, would come on again when my own house was ready, perhaps in six hours.

Have not been at school except at St. Helen's, three days a week when off work. Have been here going on for three years. Don't know the letters.

54. *William Day*, age 15.—Push cylinders into a flattening kiln. Hours (as above, No. 52). Have worked over in the place of a boy in the other turn if he was away for part or all a turn. Have worked 36 hours at a time so. Here a year. Have meals when the man puts the cokes in, which stops the work about a quarter of an hour at a time. Was in a gentleman's service before; would sooner be at this work. Was also at farm work.

Cannot read very well (book shown). Cannot read at all; only know the letters.

[Fine healthy boy.]

FLINT GLASS.

Messrs. F. and C. Osler's Flint Glass Works, Freeth Street and Broad Street.*

55. The Messrs. Osler are one of the leading firms of flint glass manufacturers, and the statement of the manager of their glass house (No. 57), gives one of the fullest and clearest accounts which I have obtained of the flint glass house system in reference to the employment of boys. In the glass cutting works is included also a brass foundry department for making metal fittings for various glass articles.

56. *Mr. A. Follett Osler.*—We have two distinct sets of works, one (in Freeth Street) where the glass is made, the other (in Broad Street) where it is cut, finished, and packed. In the latter the hours are shorter than the factory hours, and are very rarely exceeded, and then only to a small extent. There is nothing in this branch of the work to prevent entire regularity.

In the glass making department boys have regular night work, and the nature of the business requires that they should do so. Our glass can be worked only when at a great and uniform heat, and a considerable time, viz., from about Friday night to Monday morning, but with us usually now to Tuesday morning, is required for preparing and heating the material, but in the two latter processes only men are employed. The glass is worked by two sets of hands working alternately for every six hours of the day and night, and this is, I believe, the general system of the flint glass trade, though the length of time in the week for which this is continued may vary in different kinds of work and different places. It is impossible to dispense with the boys during any part of this time. Their labour is cheaper than that of men, and the profits of the trade, notwithstanding its great growth since the removal of the duty, have been so diminished that it is necessary to employ labour of the lowest and cheapest class that is sufficient for the purpose, and boys are sufficient for the work in which they are employed. There is absolutely no margin out of which the cost of dearer labour could be spared. Parts of the work are carried on at scarcely any profit whatever, and are carried on at all only because they are involved in and arise out of other parts of the work.

It would not be possible to employ boys for the day sets only, and men for the night. The boys would leave for other employments in which they could earn a full day's wages, and men could not be got to work for so little as they could earn in so short a period. If they could be got they would be only those of the least capable and respectable class; but the increase of their wages over those of the boys would still be more than the work could bear; and after all the work is such that they would not do it better than boys.

Secondly, as glass blowing is a work of a highly skilled kind, boys must be introduced to it young, in order to learn it, as they do by being with and watching the men, and perhaps in odd intervals taking up a man's work. I cannot say how young it is necessary for them to begin on this account; not under 14 probably, but I cannot say whether 16 would be young enough.

I have often considered whether it would be possible by any arrangements to dispense with the night-work; but have arrived at the conclusion that the practical difficulties are of such a nature as not to allow of this being done.

It is very important that the young should be educated. Even in work those who have been educated are more orderly and tractable as men than those who have not. We have done what we can for the education of our boys, by paying for schooling for them, if they wish to attend, and many have taken advantage of this.

57. *Mr. Lovibond Percivall*, manager of the glass-house.—In flint glass-houses generally the nominal week's work consists of 11 "moves" of three hours each, for each set of hands; two moves being taken together for the same set, and forming a "turn"; but the nominal week is always more or less exceeded, and the excess paid for accordingly. The expression "over-work" will not be employed with reference to this excess, but will be applied only to working in the intermediate turns. The actual duration of work usually varies from 14 to 18 moves, sometimes even exceeding this amount. 16 or 18 moves, however, would be a very good practical duration, satisfactory alike to the employer and the employed. Any plan which would materially diminish the time during which the manufacture could be carried on, would entail a very heavy loss, as the cost of producing the glass in a fit state for working,—the length of time necessary for this operation (about two days),—and the large amount of what may be termed "general "charges," can only be reimbursed by an extension of the working time.

The subject of working during the day and resting during the night has, for other considerations than those now put before me, long ago occupied my attention; but has been rejected as *altogether impracticable.* The number of hands employed is limited by the size of the furnace, as not only is a certain quantity of "metal" necessary, but a sufficient number of places in which the men may keep the articles, in course of making, at a due heat. Small articles are made at the mouths of the pots which contain the metal; but for larger work small detached furnaces, called "glory holes," are employed, or a pot is specially prepared in the general furnace with a sufficiently capacious mouth.

In some places, and especially where "pressed" work is made, the operations of "founding," (or preparing the metal) and working go on simultaneously; but this plan, for various considerations, is not convenient where work of the highest quality is almost exclusively made.

Taking it as an established fact, and I believe it to be indisputably so, that the glass manufacture can only be profitably carried on by day and night work, it next remains to consider whether the employment of boys and youths under 18 is necessarily a part of the system. Each "chair," or set of hands, consists of four persons, viz., the "workman," who finishes the article; the "servitor," who prepares it by "blowing," &c. for the workman; the "foot-maker," who assists the servitor in a subordinate degree; and the "taker-in." Of these the foot-maker is frequently, and the taker-in always, under 18. The age at which boys usually come to work is from 11 to 13. I have rarely taken boys at an earlier than the former age, and then only at the earnest request of the parents or friends, to whom the assistance of the boy's wages has been a matter of moment. They usually leave about 14 or 15, as, from the unskilled nature of their employment, there is no progression of wages, and there is not much opportunity of rising to a higher position. During the period in which I have been manager here, *i.e.*, between eight and nine years, the total number of boys employed as takers-in (12 being required to form the full number of chairs,) has been between 80 and 90. Of these only four, or say one in 21, have been taken on here as apprentices or under "articles"; the other foot-makers' places being supplied by persons who have received their training as foot-makers elsewhere, or who have descended from a higher stage.

The supply of foot-makers must be:—1stly, from boys apprenticed or articled; 2ndly, from boys "put

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* The name of Birmingham is omitted from this and following headings till No. 108 inclusive where the street or place is in or near that town.—J. E. W.

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"on" without articles; or, 3rdly, from men who by age and other circumstances have lost the competency to "serve." In the last case a man who is unfitted, by age or infirmity, for "serving," will not usually be a suitable foot-maker for a best place; and there is commonly an objection to the employment of such men, inasmuch as their former position makes it very unpleasant for them to submit to the kind of treatment to which the person in the lowest grade is liable. This remark would be still more forcible if applied to the prospect of old men being employed to do boys' work.

The age at which apprentices are usually taken on is about 14. I should feel exceedingly opposed to taking an apprentice of 17 or 18; both, because at this age they would possess less capacity for acquiring the necessary dexterity, (I am speaking now of youths being apprenticed who were not previously in a glass-house, because we have seen already that takers-in do not remain to this age) and because the short period before attaining their majority would leave no opportunity of recompensing the loss during tuition. As to the probability of men voluntarily remaining in the lowest grade, or at apprentice's wages after attaining 21, it would be simply fatuitous to expect it.*

Since, then, about four years of an apprentice's life would be passed under 18, any interference with their night labour would be attended with very serious inconvenience. It would not merely be a pecuniary loss, as requiring hands at a higher rate of wages, but in the majority of cases *no means* would exist of supplying the deficiency, and the whole chair would be rendered comparatively useless; indeed I may say entirely useless, since from a chair of four persons two would be taken away where the apprentice was under 18; and it is not merely that *less* work would then be made, and at a higher comparative cost, but it would be under these circumstances *physically impossible* to make the majority of articles *at all.* In addition to this, the period of unproductive labour, or that occupied in the apprentice acquiring a certain degree of manipulative skill, would be lengthened to *twice* the extent by the removal of night labour, and a still further extension would result from the very small time during which he would be receiving instruction. A marked distinction must I think be drawn between mental and manipulative instruction; in the former case a few hours out of the 24 may be adequate to impart all that the mind can usefully retain and assimilate; but where the skill to be acquired is mainly in dexterity of touch, a lengthened practice alone will ensure it. The usage of the trade commonly limits the number of apprentices to two to five chairs; or, in some exceptional cases, two to four chairs. On the whole I should say there is a deficiency of labour in the lower skilled grades. This deficiency is not by any means properly supplied by the employment of aged workmen or servitors. After a patient trial† of this plan I must confess my belief in its utter inadequacy. Old men are frequently, in the nature of things, intractable and opinionated, and instead of improving in the quality of their work they must of necessity retrograde. They are also less fit to bear overwork; in fact their employment is replete with difficulties, and a place, where they were extensively employed, would be little better than a hospital for the trade.

The work of the taker-in consists principally in cleaning off the "blowing irons" and "punties;" picking up the waste metal necessarily made in working; carrying the finished articles to the annealing "lears" or "kilns;" occasionally "warming in" the "posts" or "punties" upon which the work is to be held; tempering clay for varying the apertures of the glory holes; bringing in coal for the glory holes; and preparing clay for building up the places at "pot setting." They usually receive from 3*s.* to 3*s.* 6*d.* per week of 33 hours, and 4*d.* per move of three hours over that time. On account of occasional vacancies, or from extra boys being required for certain operations, the boys have sometimes an opportunity of working "over." These opportunities are generally eagerly embraced, great anxiety being evinced by the boys to obtain the over work, although they usually get but a small proportion, if any, of the extra wages thus obtained. Their wages do not increase with the length of time that they may continue in the house, and hence, as before stated, they seldom remain beyond 14 or 15. Their occupation is by no means an unhealthy one; comparatively few lose work by illness; certainly illness is not more common to them than to those unemployed, or otherwise employed.

As to supplying their place by labour of a more expensive nature, I should consider it very impracticable, and very unjust to the glass master. The cost of production is already necessarily so high that it requires the conjunction of several favourable conditions to guard against a positive loss. The sources of supply of labour in place of boys, premising the impossibility of meeting the want by mechanical contrivances, would be, first, female labour; second, youths; and third, old men. The first is inadmissible; the second, on account of cost and probable deficiency of supply, most unlikely to succeed; and the third would involve the anomaly of increased cost with *less* efficiency, for, in addition to former arguments against the employment of old men, it must be remarked that they would rarely possess the activity of movement essential to the taker-in; they would be *much* more liable to lose work by illness, as I have abundantly proved by practical experience; and they would be even less able to meet the requirements of overwork. In point of fact, I have frequently found that when old foot-makers have worked over, they have lost work in their own chairs. In short, it must be self-evident that their vitality is approaching exhaustion, and that they are unable to meet the requirements of any pressing exigency without serious inconvenience. I may be permitted to say that my remarks on the employment of old men are the result of observation and experience, as motives of benevolence have prompted me to use every opportunity of assisting them to occupation in any way suited to them. For chairs making certain kinds of work these men will continue to be employed to a certain extent, but for first-class work they are utterly useless. The constant glare and heat of the glory-holes and furnace affect the eyesight at a comparatively early age, and the hand becomes tremulous prematurely. These effects are sometimes attributed to drink, but it is an unjust conclusion, as I have noticed them in men of thoroughly sober habits.

Returning, then, to the necessity of employing boys at night, and occasionally for longer periods during the day, it is to be noticed that overwork is by no means certain or continuous. An example or two, taken promiscuously, of its amount may be given. In a week, when all the 6 chairs in the first turn made 13 moves each, the 6 takers-in made the following overtime, viz.:—2 of them 5 moves each, 2 of them 4, and 2 of them 3. One of the takers-in in the second turn was absent, so that his 13 moves had to be made up, and the remaining 11 moves were caused by the fact that a peculiar kind of work was being done. In another week, when all the 12 chairs made 17 moves each, 4 of the takers-in made 19 moves each, 2 made 18, 5 made 17, and the remaining one 15 moves.

A very important question in relation to glass-house boys is that of education. This subject is of the deepest interest both to our principals and myself, and has frequently received careful consideration. It is confessedly a difficulty. We have for some time done what we could by encouraging the boys to attend an excellent night school in the neighbourhood, the firm paying all expenses of fees and books; and I

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* At Bristol the brushmakers' society compels apprentices to complete their seven years though over the age of 21.—J. E. W.

† Quære "consideration"? No such plan appears to have been regularly worked, though individuals have been tried.—J.E.W.

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have also tried the plan of a bonus for good attendance. The school is open during about nine months of the year for four nights per week. The first turn boys, being at work on most of the nights, cannot, of course, attend; the second turn boys can do so by taking an hour or so out of their interval of rest; and it is my request to the master that our boys may be discharged at an earlier hour than the others. In a session of 36 nights I note the following particulars of attendance:—First turn boys,—one attended only 8 times; two, 15 times; one, 13 times; one, 11 times; and one, 14 times. These boys might probably have attended 16 times. Of the second turn boys, one attended 33 times; one, 29 times; one, 20 times; one, 15 times; one (who was only a part of the time in our employ), 17 times; and one (who lived at a distance) did not attend at all. It is, however, perhaps too much to expect them to profit much by the instruction which they receive; but I am decidedly of opinion that it has had a humanizing influence, and I believe more might be done in this direction by a modification of the times and manner of instruction.

Whilst feeling thoroughly assured that it would be destructive to the trade to exclude all under 18 from night work, I should be exceedingly glad to see some scheme devised for enforcing a certain amount of education. This, I conceive, might be attained by fixing a minimum of age at which boys should enter a glass-house. Probably, considering that a certain size is necessary for our work, and also the greater difficulty of obtaining education after entering a glass-house, the age of 12 might be fixed upon as the minimum; and I would make education prior to that age compulsory, but easily attainable.

I see no means whatever of meeting the difficulty with reference to apprentices as foot-makers. Boys under 18 must assuredly be employed, or the skilled labourers must die out, and the trade must come to an end in the country where such restrictions are imposed. Glass-blowing, perhaps more than many other manufactures, requires extended culture. So much so, that without ability a person may never rise beyond the stage of foot-maker, and similarly, as much from lack of skill as from want of opportunity, a man may never become a "workman," although he may be a fair servitor. This evil would, I think, be magnified by putting on youths of advanced age to learn. Again, if the age at which apprentices were taken on was advanced so as to meet the question of night labour, we should be much worse placed than we are at present, in comparison with other trades. Parents would not put their sons to the glass trade when they might, at a much earlier age, place them in other occupations; especially remembering that at this advanced age they would only, of necessity, be worth the same wages as at four years earlier by the present system.

The question of half-day work does not much affect us, as the plan of relays already secures that end. Twelve hours at a time would be too severe for either boys or men to stand continuously, and would not answer so well as the relay system. I once proposed intervals of 8 hours, so as to alternate the day and night work, but the idea was disliked by the men.

58. *George Arthur Wood*, age 11.—Here more than a year. Am a taker-in. Came at 12 (noon) to-day, and will leave at 7 to night, and come again at midnight and stay till 7 to-morrow morning, and come again at 12 or 12½ to-morrow (mid-day). Have dinner before I come, and stop for half an hour or 20 minutes for tea at about 4 or 5 p.m., but have no regular stop when here in the night. Breakfast at about 8, when I get home in the morning. Have meat at dinner and here in the night, but eat it as I work. Drink tea and coffee, and get water from the pump when I want it. Am paid by the manager, according to the number of turns which I work, at 7*d.* a turn. For six turns a week get 3*s.* 6*d.*, for eight, 4*s.* 10*d.*; generally about seven turns, or 4*s.* 2*d.* All are paid by the firm.

Am not short of breath, but very often have a cough; am not many days without it. Get it when I go out without my jacket and catch cold.

Was two years at a Church day school, and go to school on Sunday sometimes, and very often to church. Mr. ——— reads about God, and tells us to be good and that. Cannot read. Just know the letters (Does). Have not heard of Africa. Forget now whether I heard of France. Have not heard about the Queen or her name. Would know it if I heard it. (When asked, "Is it Victoria?") Oh, no! don't know it when I hears it so. Know 1 and 5, but cannot read "15." Go to the night school on Monday and Friday, but have not been on other nights lately, because I was not strong, and could not go when I was at work; and so Mr. Pearce (*next witness*) said we need not go. Mr. Percivall (the manager) pays 6*d.* a week for my going.

Went to work at steel-pen making first, and worked at breaking-down at the rollers, but only stayed a week, because it made me bad, and mother would not let me stay. Had to go into the pickling shop to fetch the steel about every 20 minutes, and the pickle got down my throat and on my stomach, and made me sick and bad. There was steam from the pickle, and it came where I stood. Was well before. After that I went to umbrella making, but not to call work, for mother wished me to come to glass making as soon as I was big enough.

> [The wish of the mother arose from her husband having held a good position as a glass worker. The boy looks delicate and has a weak voice and depressed listless manner. When asked how many boys work with him, only five, is unable to count them.]

59. *James Pearce*, the "workman" under whom last witness works.—I wish to let you know that boys cannot go to evening school, as is expected of them, when they are at work. It is a very good thing for them to go to school, but they must have their proper rest. This set leave at 7 p.m., but if they go to school then till 9, as they have to be back at work about midnight, it leaves them only two or three hours' sleep, and that ruins the constitution.

Know how I have suffered from the work myself. Have been in a glass-house 42 years; *i.e.*, ever since I was 9 years old. My hours of work were the same as those of the boys here, which are general in the flint-glass trade. If you attend to work, as a boy you get only about 4½ or 5 hours clear at a time. By the time you have had a wash and got a bit of something to eat, there is little time left beyond what is wanted for sleep and getting back to your work; scarcely any for going out. You leave work at 7 a.m., and get home and have breakfast by 8; then to bed till about quarter to 12, and up just in time to have dinner, and back just in time to begin work. My own father, who had been in the glass trade, and my mother were very particular, and made me always go to bed in the day for about as long as I did in the night.

My health was pretty good till the last four or five years, since when I have had breakings out; *i.e.*, carbuncle, whitlow, &c.; but I am pretty strong myself; and my health is "no criterion" of others. They are not all so. A young man last week had to give notice to leave because of his lungs.

A glass maker must eat and drink rather rough when at work, though I never drink myself when off work, though I keep a public. You are up so short and working in such heat, that you get "nesh," though not exactly hungry, and want something enticing, as hashes, and soft things, &c. Have about four meals a day, and generally meat. Am obliged to watch the glass all the time as I hold it in the furnace, or it would spoil. Though I have been a "workman" 30 years I have not had to look into such a bright hole as this for more than six or seven. For about the last two or three years my eyes have been affected, and I have to wear spectacles. Think it is from the brightness of the furnace.

> [His eyes are inflamed and watery.]

60. *Stephen John Hynett*, age 10.—Here five months. Am a taker-in, and have the same hours as the other boy (No. 58). Should have come at 12½ p.m. to-day, but did not come till a good bit arter, viz., 20 minutes to 1. Have dinner just before I come at mid-day, tea about 4½, and shall have something at about the same hour a.m. Generally have tea and bread and butter; not often meat. Am paid according to the number of turns in the week. For six turns 3*s*., for eight, 4*s*.

Was two years at a Church day school, till I went to work. Have been on Sunday sometimes, but do not now. (When asked why he left off, does not answer, but his brother, who is by, says it is because he has no clothes, J.E.W.) Go to the evening school on Monday and when I have done work on Friday. Can read (only one syllable words). Can spell "entrance." Do not know what it means.

> [The brother, a little older, says that he can read better himself, and goes to school on Sunday, but not very often. Of the other boys the eldest reads fairly, the remainder say that they can all read a very little.]

61. *Arthur Edward Arnold*, age 13, taker-in.—Am come in now (Monday afternoon) to get the "horse" ready for the foot-blower to put the "marver" (polished steel plate) on, put the clay in its place, &c., so as to be ready to begin at once to-morrow. Have made four turns over in a week because there was a different kind of work. Mother puts all my wages over 3*s*. in a club for me. When I make overtime I get 2*d*. of it for myself.

Go to the Sunday school and to the national school when I have got a chance. Can't hardly on Friday, when at work then. Got a prize for going 72 nights last year. Mother made me go. Can read. Could remember it better before I was here.

> [The horse must be got ready each time, as if it is left in the glass-house the heat dries the wood too much. When I found this boy no other glass "maker" was present, work not beginning till Tuesday morning.]

62. *William Leggatt*, age 15.—When I first came here (the glass cutting works) from a brass founder, three years ago, I waited on the men, carried up the sand to them, washed off dirt, and sometimes put on putty for a man when he could not himself, because using both his own hands to hold a large piece of glass on to the wheel. After a year I began puttying, which took about a year to learn. Hold the glass on the wheel with one hand, and keep putting on (liquid) putty with a small bunch of straw held in the other, so as to polish the glass and prevent it from cracking. This wets my hands and splashes a good deal, but I wear an apron and a slop (canvas frock or jacket), both my own, to keep my clothes clean. Wash my hands and arms generally, not my face, in a bucket here before leaving, and wipe them on my apron. There is no towel.

Have been bad "now and again" with the bowel complaint; only once since Christmas. (It is now early in May). It is a very bad pain. The doctor says it is caused by the putty, and gives me medicine and a mustard plaster. Never had the pain before I was at the frame using putty. Have a good appetite and no coughs. My throat was bad last week, but does not hurt me now. (He is hoarse.)

The hours are from 7½ a.m. till 6½ p.m., and there is very seldom any overtime, but sometimes there is for one, two, or three hours, and we once stayed till 10 p.m. Have breakfast before I come, and go home to dinner at 1, and never begin work before 2. Earn 5*s*. a week, and rise 1*s*. a year. Mother gives me 6*d*. of it to buy my clothes. I am paid by the firm.

Was at school till I went to work at 10 years old. Can read (slowly but without mistakes). Can write small writing, and do "straction."

> [Looks delicate. His face is splashed with putty from his work. This and the remaining witnesses are in the Broad Street works.]

63. *George Walker*, age 17.—Smooth at a wheel, always wet, and sometimes I putty. Polished before. Have been at the work altogether five years. The work don't suit anyone. It's nasty poisonous stuff. It makes you feel very low and fatigued; feel very funny. Feel too as if you wanted to cough. When you use the wheel nothing near so much dust flies off as when you use the (revolving) brush, which you must for mitre-cut work, which the wheel will not reach (the cuts being fine). Have worked as much as half-a-day at a time with the brush. There is no rule as to how long you may work with the brush.

> [A workman near says that when three or four brushes are going, as is the case at times, there is such a cloud that a person cannot see along the shop.]

64. *Thomas Freeman*, age 15.—I putty and also polish. Have done so for three years, and was here at other work for a year before. Have the headache, but was always used to it; have no other pain. Got my hand in the band of the wheel just now, and do so at times. Should have to look sharp then or would get drawn under it. Some one could stop it, but I could not myself. Never saw any one drawn in by the band.

65. *Joseph Aston*, foreman of the glass cutting shop.—Have been at glass cutting 32 years. There are two youths under 18, (He omits probably the witness George Walker, who is nearly 18,) and four young boys helping here. Generally take them at about 11. One is 10, but that is the youngest I have had, and was only taken because his mother came and begged so. These young boys get 2*s*. 6*d*. a week.

Puttying is the most injurious part of the glass-cutter's work, whether done on the wheel only or with the brush. It is injurious to the hand, and the stuff of course gets into the pores of the skin. You cannot avoid it. The doctor has told us this. Doctor Waller was making many investigations about it some time ago, and had interviews with glass-cutters. Washing is the best thing to prevent its bad effects. It draws the hand up, and takes away the use of it. There is an elderly man in the shop now who suffered from this, but he has returned to work. Putty is used both in polishing and finishing. There is no rule as to how long any one may be engaged on the most injurious parts at a time. Each has to finish his own job, and he may be at the bad part more than a day at a time.

Getting caught in the bands is the regular thing, especially when putting the bands on to the wheels; and I have known many cases of this, but not so much here.

66. *Ebenezer Parker*, age 17.—File and turn metal at a steam lathe in the brass foundry shop. Filed at a vice here for five and a half years before I began at the lathe half a year ago. Grind my own turning tools at the grindstone, generally for five minutes two or three times a day. Have no cough except in winter.

Was at school in London, paying 4*d*. a week, till 11 years old, when my father died, and I was sent down here. Have been at Sunday school ever since I came here, and to night school for two winters. Can read, write, and do compound division.

67. *George Button*, age 12.—Turn screws, &c., in the brass foundry shop. Before I was here was at a screw factory. Blew the bellows with one hand and pulled the screws out of the fire with the other; so was close to the fire. It was very hot and I did not have my waistcoat on as here; but it did not always

make me wet. Had a coat, but seldom put it on when I left work, because I was so hot. Often caught colds there. The regular hours there were from 6 a.m. till 8 p.m., but we had to go as early in the morning as we could,—at 5 sometimes. We stayed after 8 p.m. more often than not; my latest was 9. Had an hour for dinner, and half-an-hour each for breakfast and tea, for all of which I went home. There were other boys there and many men. Had 2*s.* 6*d.* a week there, and have 3*s.* here.

Was at day-school a month once. Began to go to Sunday-school just before the Princess was married: the Sunday scholars were to have a breakfast. Go still (May 1863) to the Sunday-school. Read (short words). Always knew my letters. Mother always learns me at home at night.

Mr. A. Arculus', Flint Glass Manufacturer, Broad Street.

68. *Mr. Alfred Arculus.*—All who work in the glass-house here, except the takers-in, are over the age of 18. The general age for taking boys as apprentices, for which the quicker and more promising are chosen, is about 15 or 16; others begin foot making, not as apprentices, at from 16 to 18.

If boys under 18 were prohibited from working at night, it is possible that the taking in might be done by men; but this requires an increase of wages which would so seriously affect the remuneration as to make the risk and trouble of the business scarcely worth undertaking. The greatest objection, however, would be that it would prevent the training up a supply of skilled labour. I do not see any necessity for boys under the age of 14 in a glass-house; but between that age and 18 they are important.

In the glass cutting shop 2½ hours, or a quarter of a day's overtime is occasionally made. All, both in this and the glass-house, are employed directly by me.

If all were receiving education up to the age of 14, it would be much better for themselves, their employers, and society. I believe that every man at the head of a chair here could well keep his children at school up to that age without any of their wages.

69. *Alfred Higginbotham*, age 14.—Taker-in. Am in the second turn, which begins work at 12 in the middle of the day on Monday, and works every other six hours up to Thursday evening or Friday morning. For the last four weeks it has been till Friday. Will get to bed by 8 to-night; up again at ¼ to 12 p.m., and here in a few minutes. Breakfast at 5 a.m. here. We don't reckon any time for it, but stop till we've eat it, and then go on again. When I leave in the morning I go straight off to bed; get up at 11½ a.m. again; have dinner, and here before 12. We must go to bed each time, or we could not do the work. Always do go to bed unless I am working over, *i.e.*, taking the turn between, which makes 18 hours' work running. Did this three times last week, and will have done it three times by the end of this also. Never miss a month without doing it, and sometimes do it two, three, or four times in a week. Fall sleepy, but am obliged to lighten up as much as I can. Could often fall asleep when I come at night till about 4 a.m.; but we liven up then. Have seen a boy about my size, but older, who has now left, fall asleep after working several turns over running. He would come on a Monday morning, say, and work straight on to Wednesday night without going to bed, taking both his own turn and another boy's. Have worked about 36 hours myself without going to bed. What I get by working over I have for pocket money; of what I earn usually for regular wages, about 4*s.* 9*d.* a week, I only get what mother gives me, 4*d.* or 3*d.*

Don't ever play in the morning. Work tidy hard, and have about as much as I can do with it. When I leave work I undress and wash me, and feel less tired then than when I get up again. Am away with the sick headache sometimes, but when I am bad it is generally with a cold. When I have been sweaty and have to run out with an errand a mile or so with only my shirt and trowsers on and it is very cold, I catch cold. Or we play with one another, and throw water, and catch cold so. At times something comes over me so while I am at work that I can hardly breathe; it hurts me very bad too. Have had this once or twice a week for about three months, never before. Have never complained of it.

My hand is tied up for a hurt got while I was "warming in," *i.e.*, holding the iron into the furnace. The servitor put his iron with the hot glass on across me, and took a piece out (*shows the raw sore*).

Can read "and, the, and so," but not more. "51" is "50." Was at day-school 2½ years once, never at night, and have been sometimes on Sundays; but sometimes lie in bed all the day. Used to do so when I first came to a glass-house two years ago.

70. *Charles Burrows*, age 13.—Taker-in. Am in the first turn, and begin at ¼ to 6 a.m. on Monday and work till 12, and so on six hours on and off till Thursday night. Stop for breakfast at 9 a.m., and also at 9 p.m. Was in bed till 5 this afternoon, but sometimes when away do not go to bed at all. Am very tired at times. Have worked four turns together twice. At Harris' (large glassworks now shut up, J. E. W.), where I was 2½ years, they always wanted me to work over. Have that money for pocket money. We often get burned if we ain't careful. This burn was from the metal slipping.

Do not know T, E, or D. Never was at school in my life. Have got no things to go in. Earn about 5*s.* 4*d.* a week regularly. Father is a brickmaker, and I have two brothers at the same work as myself. Do not know of Queen Victoria, or what the sea is; but have heard the name on it.

71. *Charles Samuel Vaughan*, age 12 years 11 months.—Been in a glass cutting shop since 8 years old, and was at wheeling coal for half a year before. Smooth, polish, and putty at the frame all day. Began a few months ago. Do not finish all my own work.

Can read, write, and do multiplication and addition. (Reads "place" as "black," &c.) 3 times 9 is (after much thinking) 27. Was at day-school for a bit, and have a prize every six weeks for going regularly twice on Sunday. Also go three nights a week to Winfield's school. (The Messrs. Winfield, of whose school an account is given in the evidence on the Birmingham metal manufactures, till lately, owned these glassworks also.—J. E. W.)

72. *Patrick Wayland.*—Metal mixer. If a man has not strong lungs, this is the very worst work in the world. The bottoms of the nails are the places where it affects you first, and then it goes all through you. It is a great thing to be temperate, but some will knock about and drink. There are not many who have been at the work so long as I have, viz., 11 years, but I have never been away a day.

Mr. H. Sarson's, Flint Glass Manufacturer, Upper Windsor Street.

73. *William Price*, age 15.—Taker-in. Am now working over, as they call it, *i.e.*, working in the other turn. Do so whenever I get a chance, because I get 9*d.* for myself for each turn over, but my standing wages of 5*s.* a week I take home. Have worked 8 turns over and had only 24 hours sleep in a week, resting only for a turn now and then.

Was always pretty well before being in a glass-house, which is now three years. Since then have been "drowland like," and have headache, and cannot eat when I am at work. Am not giddy unless when working over. Have been giddy this afternoon.

Never tumbled down from it. No, am not strong now; was very strong before I came to work at a glass-house. Can always breathe well. Often catch colds when I am hot and go running in the street of errands without anything on. It would not take long to slip my waistcoat on, but the men won't let you stop for that. Am 'most always catching cold in the summer; the wind must catch hold of you. In winter we are not so hot in the glass-house, and work in our waistcoats. Even in winter I come only in my waistcoat; I live close by, and if it were frost or snow it would not take long to run home through it. Never went to the doctor, but mother gives me medicine for colds, &c. Wash when I go home. Wear the same shirt day and night for half a week. Never sweat much myself; others do.

Can tell my letters, but not spell. Am going to school next Sunday because father told me. Have not been many times at a church and chapel; three or four, or four or five times in my life. People go there to hear about the Lord. He reigns over us. Christ cured the lame, and blind, and was crucified. Heard that at Sunday school. France is a town; isn't it?

> [Unhealthy looking and pale. Intelligent. If he really did work 8 turns over and had as it appears he did, one or two turns rest, and he could not well have done with less, his own turns, which he would naturally work, must have been at least 9, probably 10, possibly more; but taking 10 as the most probable, this gives a period of 120 hours, broken only by two intervals of 6 hours each. The full amount of work implied by his statement did not strike me till I reckoned it up afterwards, or I should have questioned him further as to so improbable a fact.]

74. *George Burnsley*, age 15.—Taker-in. Have been at three glass-houses before this. Have worked as many as seven turns running; and five turns running often.

Was never at a week-day school. Go on Sundays. (A man near says that he saw witness playing at "pitch" on Sundays at school time, so that he cannot have been there.) Do not know "I" or "B."

75. *Thomas Winchurch*, age 13.—Taker in. Am in the second turn, *i.e.* from 12½ p.m. to 6½ p.m., and from 12½ a.m., to 6½ a.m. Will wash me and get to bed by 8½ this evening, and be called by the "teaser" at 12¼ a.m. Begin work on Monday at dinner time, and finish on Friday night, except at Christmas time, and then work till Saturday morning. Generally work over one turn or so a week, and sometimes five turns. There are six boys in each turn, the youngest 12, the eldest 15. Am now trying to blow a bowl, as it is tea time. Generally try when I have got time, as now, when stopping to have our tea. Can read a very little. (Can.)

> [These three boys all agreed that they worked over, every week, one turn or so at least, often more.]

76. *George Gage*, age 15.—Foot-maker, and have been so 2½ years. Have been in a glass-house six years. Have not good health.

> [Very pale and thin.]

77. *John Jones.*—Metal mixer. Plenty begin to "blow foot" at 17 or 18 years old, some at 20 or more. These do not remain as takers in up to that time, but do other jobs. Should say that 16 or 17 was the common age for beginning to "blow foot."

78. *Mr. Thomas Miles.*—Manager. Boys work over to take the place of other boys who are away, or if another boy is wanted for a particular kind of work, as the press, at which a boy is wanted to hold the punty iron to the glass to lift it out of the mould. We use the press but very seldom, perhaps once a month; in some places it is used almost every day. If boys are away from work it is generally their own fault, not from ill health. There is no system or order in which the boys are taken to work over; those who wish it most have the work. It is, I believe, the general custom for them to have the money which they make in this way for themselves. They must begin to be foot-makers before they are grown up, for they could not stay till that time at a mere taker-in's, *i.e.* boy's, wages, and if they went to other work meanwhile they would lose the necessary familiarity with the work. Many never get beyond being foot-makers at all. There are middle-aged men here now who have not. This depends upon their want of talent for the work.

79. *Samuel Bevan.*—Foreman of the glass-cutters. There are two cutting shops with men and boys, and a shop with men, 7 women, and a girl who rough glass at steam lathes.

I was brought up as glass-cutter from the age of 14, and have had many years experience of the trade, and have had occasion to make myself generally acquainted with it by correspondence, as well as having seen it personally in many parts of the country. There are in the whole trade something under 1,300 men, and rather less than a fifth of that number of apprentices besides. There are in addition young boys to wait upon the men according to the size of the shop, perhaps on the average about one to a shop of 20. These boys have not the strength to carry things and do what is wanted till about the age of 12. I have taken younger out of charity, some being without friends able to support them or neglected by them. A boy has not the strength or knowledge, both of which are necessary, to begin cutting till the age of 14.

The healthiness of the trade depends entirely upon cleanliness and ventilation. If a person will eat dirt, he must. I mean literally eat dirt, as a person must if he eats without cleansing his hands after work. I keep a watch over this, and if I see any negligent, or, as some do, rubbing up the quick at the bottom of their nails, which exposes the flesh, and is therefore very bad, I caution them. Every one here has his tub of water, and as much fresh as he pleases. In winter the engine pumps up hot water. The drop of the hand, I am convinced from experience, comes from a strain upon the muscles, such as is caused in particular when men have been drinking and have to clutch the glass very tight. If there is any fear for the hands, washing in olive oil will make them right. I did so myself at one time. A little castor oil will do for the pain in the stomach. I have not suffered in health myself, nor have any of my relations who have been engaged in the trade.

The shops also should be well ventilated, both on account of the number of breaths and of the pernicious material used. There should be only about two-thirds of the usual number of slates, so as to allow the air to escape between. This shop is extra well ventilated, having openings at the side under the slate, through which the hand could be put, as well as traps above.

The empty places here are in consequence of some men having been just discharged for drunkenness. Drinking is ruinous. I like myself and other men to enjoy as much as is good, but not boys. If men drink at work it teaches the boys. That is a shame; and I never allow drink to be brought in at work. I object altogether to girls working in factories.

It is a noble thing for the Government to try to improve the condition and education of the boys. I once got some assistance and took a room, and had 30 or 40 little lads in it, preaching to and teaching them on Sunday, and at my spare times in the week, and got on very well with them; but after a time was obliged to give it up, because all the expenses would come upon me, and also certain abuses had arisen. But after all the important education is that of the fireside. What is taught there is remembered.

80. *John Smith*, age 11.—Wait on the men in the cutting shop. Went to work at guns when going in 8. Had to carry them about, and got 1*s.* 6*d.* a week. Went at 8 in the morning, and the man used

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Flint Glass.

Birmingham.

Mr. J.E.White.

q.

to send me home at what time he had a mind at night, at 9 or 10, sometimes at 8½ or 7½. Went from him to another gunman. Was the only boy at both. Left the first job because I had a pair of boots that crimped my feet, and I could not get about quick enough. I told the man I could not go quicker, but he used to hit me about the head with a file haft, and throw things at me. The next man did not beat me; mother had "knowed him ever since he was a little babby."

Don't know all the letters. Was never at a week-day school, and only two or three times on Sunday; and never at a chapel except when I went with the school. People go there to hear about God. He made all the world, and children, and people. They said He was good to all. I suppose He is the same to the bad as the good. (Does he punish any one?) Don't know about that. Have not heard of Christ: I had never done my work till so late. Yes, I think He was good, and was crucified; but I do not know why, or if He was ever alive again, or if I am a Christian, or any people are. Didn't think about it. Mother told me I should say my prayers, and my brother said I was to say it arter him in bed; but I don't know them, only the first word, "Our Father." That means God, I suppose.

[This boy has no father, but a very respectable mother, and bears a good character himself for quickness and diligence.]

81. *John Nettlefold*, age 14.—Smooth and polish. I went to a brass casting shop at 8 years old. At school till then. Go on Sunday sometimes. Know my letters, but can't read.

82. *John Judge*, age 14.—Smooth and polish. Work from 6½ a.m. till 7 p.m., the engine stopping half an hour for breakfast at 9, and an hour for dinner at 1. Am away with the headache sometimes.

At school till 11, when I went to gun filing. Go on Sundays, but never to a night school. Can read a little (very slowly), write a very little, but not count figures.

83. *Charlotte Price*, age 15.—Rough glass lamp globes on a steam lathe, by holding on a bundle of wire dipped in wet sand with each hand. Wear the apron to keep the dirt off. Don't wash; there is no place for it. That tub (Very dirty water) is for the glass. Pull the band on and off with my hand; never hurt myself with it. Work from 6½ a.m. till 7 p.m., and till 1 p.m. on Saturday. When busy, stay till 9 or 9½ p.m., but not often; only in winter; perhaps about a couple of nights together every other week, for a time. Have worked at this a year.

Cannot spell. Could not go to school often because I had to nurse the children, mother being at work here.

MR. G. HUGHES', FLINT GLASS MANUFACTURER, TOWER STREET.

84. *Mr. George Hughes*.—I employ only three boys, takers in, all relations of mine, and two men. The two men work with the two boys, aged 14 and 15, from 7 a.m. till 7 p.m., and I with the youngest, aged 13, from 7 p.m. till 7 a.m. In the day they stop half an hour for breakfast, an hour for dinner, half an hour for tea, and 20 minutes for an 11 o'clock; and we give just the same times, and look for just the same meals at night. We reckon it 9¾ hours work. However, these boys are too old to begin as glass-makers, and I only employ them just for the sake of it. I began myself at 7 years old, under my father, who could take the bore off me; and I should put my own child to it at 9, because I could spare him more; and he would not get "munched." It is not likely that a man's own child would be punished as much as another person's boy. But as for the work itself, the bigger they are the better, as long as they will come for the wages. They can stand the work better than the younger. When I began so young I cried to go from school to work; and when I was at work I cried to go back to school.

There is no rule as to the age at which a boy will get to be a foot-maker. Some will take it twice as quick again as others, and are as "gain" again; one will get to be a workman before another has blown a foot. Some will never get to be a workman. A lad that worked with me, though now 19, is still a taker-in at another place. I am sure, however, that there was a saucy tongue there, and know that he kept language that would not suit a big house. If a person wants to get on he must not have a saucy tongue. It is impossible for anyone to learn unless a man will let him. Boys are not apprenticed as foot-makers till the age of 14; and those who are not apprenticed begin later, some at 17. It depends, in great part, upon the parents. Some press their boys on more and get them made apprentices. I have not known many become foot-makers until they have been two years in a glass-house. A man would not let a boy touch an iron till he had been eight months as a taker-in, and had so learned the temper of the metal, because he would not have his iron messed. A man can tell in a moment whether a boy has got the gift for the trade. I could, as soon as ever I saw one take the iron.

A man could not possibly do a taker-in's work. It would kill him, stooping and being up and down so and about.

I am up now (afternoon) because I can do very well with six hours' sleep in the 24. Six is plenty for a man by either night or day, but not for boys. The young ones will "sleep till the cows come up," so to say, and never wake. A child is always sleepier than a man. If a boy lives any way off, what with going home, washing and cleaning, and being called an hour before the time, he don't get more than four hours' sleep at a time twice in the 24 hours. Most of them take this, so it leaves no time to go out or play.

As to school, not one in a hundred goes either on Friday and Saturday, or on Sunday either. They enjoy Sunday in the streets and fields just like a horse, and gallop about at their leisure. My parents were strict and sent me to school on Friday, Saturday, and Sunday, and kicked up so at my leaving.

I have worked in most of the glass-houses here and in the country, *i.e.*, Stourbridge district, as well as in some other parts, and have done different kinds of work. The work varies very much according to the article made. The larger things, such as decanters and everything about that size, are made at the "caster-hole" or "glory-hole," a furnace separate from the pot. The caster-hole work requires strongly built men, with large chests. Some of them are the strongest men that can be had. 7 lbs. weight of glass at the end of the iron is as heavy as 2 cwt. is to heave in a barrow. I can wheel 2 cwt. better than I can wrostle 7 lbs. of glass above me. The 7 lbs. takes as much power. I have seen a man work 22 lbs., but that is the most that ever I did see. Generally, when a man has such a heavy piece, he has some one to help at heaving it and others to keep the heat off his arm with boards. I have worked at both the caster-hole and the smaller work, but am not properly big enough for the former.

As to healthiness, it is like other trades. Some are weak, and some are not. Of course they will have their drink.

Glass makers and glass cutters are an entirely distinct class of men. Though working on the same premises, one never passes into the work place of the other. It would not do. They may speak perhaps in the streets if they happen to know one another.

In Ireland there are two boys to do exactly the same amount of work, and of the same kind, as is done in England by one. There were three flint-glass houses only in Ireland a little time ago; I cannot say what there are now.

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MR. T. HATELEY'S, FLINT GLASS MANUFACTURER, CHESTER STREET, DARTMOUTH STREET.

85. *Mr. Henry Hateley.*—My glass is chiefly for lamps. The best age for boys to come into a glass-house is at about 11 or 12, but if they did not come till 13 it would not hinder the work, and they would have time to learn to blow foot. I have known some come very young, as young as 7, but I think it is no advantage to the young ones to come very early, and wish it were done away with. They could learn to blow foot well if they began it at 16, and I do not know that there is any good in their beginning before that.

I have just been reading the account of the Potteries.* It is more horrible than one can think, and there must be a way found out of such a state of things. There is nothing of that kind in glass making, but there is a great want of education amongst the boys. Cutting work is worse than blowing. If it is necessary to do anything for them, it might be done, and there would be a way. A big boy could work as taker-in through the two day turns, and a man through the two night. Many years ago I knew a taker-in in a large house in London who was over 18, but there a per-centage was paid on the work done, and the men made as much as they could. I have known a man make a double week so.

In cribs, small glass-houses, in which they make common work, as small bottles, &c., where quantity is required more than goodness, and the pots are small, they work on for 12 hours, till the pots are finished. The boys in those places are about the same age as in larger houses, and are one, or two, or three in each. A few years ago there were 36 such places in London, but I think that there must be more now.

[Mr. Hateley afterwards made personal inquiries through a small glass master in London, of the kind referred to, employing three men and two boys, and added the following statement as the result.]

My friend knows of 40 cribs in London at the present time, and would think that there must be towards 50, because many have got into the business lately. Some have only one or two boys, some more; but three is a full average. Most of the boys are little, and seem about like other glass-house boys. In some cribs they work only by day, and fill and heat by night; in others they work day and night, 12 hours, alternately. There are, besides, a very few houses of a size between these small places and the regular large works. He knows of about half-a-dozen.

86. *Henry Whitfield*, age 13.—Taker-in nearly three years. Am just come on now, $6\frac{1}{2}$ p.m., for 6 hours, and will stop half an hour for supper at about 10. Have breakfast about $8\frac{1}{2}$. Begin on Monday morning and finish Thursday night or Friday morning.

Have been pale, like this, since I was at work; it came on me here. Have the headache at it. Last summer I catched a very bad cold. I sweated awful in the glass-house, and drank a lot of cold water and went and stood outside. Was in bed a week, and away from work a fortnight. Had bad pains over my chest and neck, and couldn't swallow, and could hardly fetch my breath. Mother thought I was dead every time I began to cough. It took my breath from me, and I had to drink water. Did not spit blood or anything. Am right enough now (*catching his breath between his sentences*); but when I am taking in a heavy piece of glass, as one of $1\frac{1}{2}$ or 3 lbs., I am out of breath still. 3 lbs. at the end of a long stick,—so long (about 7 feet) is awful. When I put it down my breath is gone all in a minute. They wanted to put me at heavier work, but I would not. (*Coughs. Is out of doors.*) Often do so, particularly if there's a deal of smoke.

Am always tired, and at the end and in the middle of a turn am awful tired. Have never worked over more than three turns in a week, or than two turns over together (*i.e.*, two turns of six hours between three of his own, making 30 hours running). Whether you work over or not just depends on whether they want you. They wanted me to work over a few days ago, but I said I was tired and couldn't.

The cut on my nose is from a piece of metal that fled at me this morning as I was cleaning the iron. Have got an awful burn on my foot; will show you the mark. (*Shows scar.*) Was passing the "horse" when a chap hit the iron and the metal dropped and got into my boot, and I could not get it out in time, and so got burned. The other boys get burned too.

Was always at school till I came here, *i.e.* for seven years, but ain't a very good scholar.

[Very pale, breathes hard, and coughs several times. "It makes 'em pale at this job, they don't have much colour," said a man passing. As I was speaking to this boy one passing said of another, "He's going to work over."]

87. *Samuel Bayliss*, age 13.—Taker-in 4 years. (Coughs.) It don't hurt me anywhere.

Could read pretty tidy when I left school; and now only know the letters.

[Has a loose cough.]

MESSRS. LLOYD AND SUMMERFIELD'S, FLINT GLASS MANUFACTURERS, SPRING HILL.

88. This is one of the principal flint glass manufactories in Birmingham. In the cutting department large ventilators have been put up with a view of carrying off the noxious air which necessarily results from the nature of the employment.

89. *Dr. Lloyd.* We manufacture flint glass articles of all kinds. This manufacture necessarily employs boys in the glass-house at night. It is not however necessary that any boys under the age of 13 should be employed in the glass-house at all, though the general custom of the trade is to employ them at any age from 9 or 10 or upwards, as at present we do ourselves. Indeed, considering the necessity of night work and the heat of the work places, it is better that they should not be employed under the age of 13, and I think it desirable that employment in a glass-house under that age should be prohibited as improper. They must however enter the employment shortly after that age, at latest within a year or two, and when they once begin they must work for a portion of the night.

The work itself must go on continuously by night as well as by day, for two reasons, one affecting the employers, the other the employed. The heat must be maintained throughout, and consequently any interruption in the work would cause a waste of all the coal used during that period; and moreover, there would not be time to work the metal during the four full working days, for the men can in general only work six hours at a time. The work itself, except the lowest part done by boys, is too exhausting to be continued for a whole day of 12 hours, and half a day would not be sufficient for men, as their earnings would be limited in proportion. This has led to the general system of six hours alternate work and rest, which allows of a full amount of work being done without excess of fatigue. In the preparation and heating of the metal, which usually occupies from Friday evening to the following Monday morning, men

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* From the First Report of the Commission then lately published.—J.E.W.

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only and but a few of them are employed. The glass working process consists of several stages, usually four, and the persons employed in these stages must all work together, which they do in chairs or sets of four. The lowest place in the chair is taken by a boy. In our glass-house there are 11 chairs, which employ in this way the only persons under 18 now engaged there, though at other times we may have some apprentices under that age doing higher work. The work of the lowest boys, called takers in, is of a very simple kind, in which the strength and skill of an adult would be wasted. It consists chiefly of carrying each article as soon as it is completed to be annealed in the lear or in the kiln according as it is light or heavy and consequently requires a shorter or a longer time for annealing. If the work is heavy, and in some cases we have pieces weighing as much as 70lbs., the apparent weight being increased by its being at the end of a long iron, and that end being too hot to handle, it is carried by a man. The smaller the articles made the more constant is the need of a boy's services. The boys also carry and clean the irons for the men, go errands, and do other odd work. This work prepares a boy for the next stage, that of being a foot-maker, and must be continued for that purpose for at least from two to three years.

Simple, however, as the boy's work is, it varies in different branches sufficiently to prevent the same boy from working in two different chairs. The employment of double sets, though practicable as far as the work is concerned, would create difficulties with the workmen.

The second stage should be, and generally is, reached by about the age of 15 or 16, and the third, that of servitor, by 21; in case of a promising youth by 17 or 18. The natural progress, however, of a glass-worker is largely affected, and often much delayed, by the rules of the workpeople, enforced through their trades unions, made with a view of obtaining an artificial equality of wages, and preventing their depreciation by limiting the number of skilled labourers available to the employer. This limit they assert to be beneficial to the masters, by acting as a check on over production. To some extent this is true.

I have had some experience of the difficulties in the conduct of the manufacture which arise from the operation of these trade rules, having acted for several years as Chairman to an Association of the glass masters of the Birmingham and Stourbridge districts conjointly with the masters in Scotland, Lancashire, and Yorkshire, formed about 4½ years since, to counteract the influence of the unions, and to resist a strike commenced at Stourbridge in 1858; and I anticipate that these rules would occasion some difficulties in the working of any legislative regulations of labour in glass-houses, even where such regulations might otherwise be practicable without injury to the trade.

I see the desirability as regards the boys themselves of prohibiting night work until they are grown up, but as regards the work, on account of the system on which it is conducted, I cannot see how such a prohibition is practicable if it extends above the age of 13, that being the highest age at which a boy can begin to fit himself for acquiring the necessary skill. So far as a mere increase of cost from employing adults at night or other times if necessary in the place of boys were concerned, this might be met, unless it were so considerable as to introduce danger of loss from the competition of foreign manufacturers. The English trade is already at a great disadvantage in respect of the cost of skilled, as well as of ordinary labour.

Though employment in a glass-house is laborious it is healthy. The air, though hot, is pure, and there is constant exercise. Men continue the employment very frequently till the age of 60; and in one case we have had in our glass-house at the same time members of three successive generations, one, a man of 74, who began at the age of 10, and whose father, also a glass-blower, lived to upwards of 100. The old man of 74, still with us, is of course unfit for laborious parts of the work, and is employed in the lowest occupation of a boy, but not as "taker-in." It is not possible that men past the age for heavy work, could supply the place of boys for night work, if boys could not be so employed; for an old man would not be quick enough in his movements, nor would he submit to be ordered about or scolded as a boy is.

The glass cutting is far less healthy. It is entirely a sedentary employment. The use of a noxious material, putty, which vitiates the air, which is more confined than that of the glass-house, is necessary, and the temperature is usually high, viz., about 65°, and meals, &c., are often cooked at the stoves, and eaten in the rooms. It is impossible entirely to remove the noxious effects of putty by ventilation or other means, though they may be much lessened. We have taken great pains to secure thorough ventilation in our own glass-cutting shops. The hours of work in these, with very rare exceptions, are uniform.

We have also some persons employed in miscellaneous employments whose hours are equally regular, *e.g.*, women, in cleaning and wrapping up glass, also in roughing lamp glasses, &c., but not children or very young girls in any occupation. (*i.e.*, excepting glass-house boys.—J.E.W.)

It is probable that if the boys did not begin to work at their present early ages, and were better educated, they would come to their work with greater strength and health of body, and improved faculties of mind, and would, therefore, stand a better chance of success in life, and they would certainly be more profitable to their employers. More knowledge and intelligence would also enable them to form more independent and better opinions on all practical matters than the mass of them are able to do now, and would make them less liable to be misled by agitation in regard to their real or fancied interests. The employers and employed would thus be able to explain and understand their own natural views and interests better, and so to act more for the true benefit of all concerned.

The prohibition of the employment of children under 13 years of age seems to be most important on the ground of moral and mental training; but it must be a general prohibition, for if confined to particular trades or occupations it will, by deterring children from these, only drive or lead them into others, in which money can be earned; and thus the main object of the prohibition would be defeated, and the prohibited trades or occupations injured by the loss of so much inexpensive labour, and without a better order being substituted.

90. *Thomas Compson*, age 15.—Taker-in. Also gather for about four turns in the week. Father made me learn that about two years ago. May as well learn that as anything else. Most boys who work with their fathers learn gathering, and take four, three, or two turns a week at it. The fathers like to get their own boys on, but the men don't care about the boys. Two or three boys here under 10 years old gather for one turn or so in a week. Have seen many at 8 or 9 gathering, and have seen one as young as 7. He had to stand on the round-about, what you call, up against the furnace, to reach. There are generally a good many as go to learn work in glass-houses at about seven years old. Suppose they think they'll learn all about it by about 14. Some will take it as quick again as the big ones. Have a brother of 12 here in the same turn as myself.

The hours of my turn are from 7 a.m. till 1 p.m., and from 7 p.m. till 1 a.m., beginning on Monday morning and ending Friday at dinner; but the takers-in have to come about half an hour before each turn to get the things ready. Have breakfast in the morning turn, when all the breakfasts come, for towards half an hour, but no fixed time. Dinner at

2, after I get home. Wash me and go to bed by 2¼. Get up at 6, or 6.10, and have tea, and to work here by 6½. Have nothing to eat between then and when I knock off, at the middle of the night; but mother always leaves me some supper on the table. Get to bed directly then.

The work is very hot, and makes your shirt sweaty. In summer it's awful. Wear the same shirt all through the week, and sleep in it, but undress on going to bed at both times. Always wash me before going to bed, my hands, face, neck and arms. There is a good many as wash dirty,—what they call "the "glass-house wash," but father never let me do so, and if I did, always made me wash over again. Can always go to sleep well if I've washed. If I haven't, I always have to get up again and do it.

Am always weak, and have been since four years old, when I sprained my ancle, and the doctor orders me milk and new laid eggs. Think I am stronger now than when I came here. Can "eat all afore "me now." Have had these lumps here (in throat), but they are gone a good deal now. Generally speak like this (is hoarse). Glass-house people always do, because your throat is always dry; but your voice is better when working in the glass-house than when you are out of it. (He has come out to me, J. E. W.) When my throat is dry I can get water down the road. We drink a lot of water and make our bellies ache. When I first came used often to catch cold. When I went out did not put my jacket and waistcoat on because I was so sweaty, but carried them over my arm. Used to sweat more then, but now am more used to it, at least take more care as I go away. Generally have burns (*shows one on his hand about the size of a fourpenny bit, quite raw*), because when you clean the irons off you don't know where the pieces will fly to.

Father took me from the Bluecoat School at Dudley at 10 years old to go to a glass-house. The schooling was free, and if you behaved well they reckoned to give you three new suits of clothes, one a year. I cried so not to go to work, and father and mother said I should not go, but I went. Go to school on Sunday now, and all the nights that I am at play (not at work). Can read (scarcely). Can write a great deal better than what I can read,—can write my own name and letters too when mother spells the words for me. Often do so. Never did much summing; a few, but very little ones. Learned these most at the night school.

[Without colour.—Very pleasing manners.]

91. *Joseph Jones*, age 13.—Taker-in. Do not ever gather. Am under Mr. W., a workman, who pays the chair, but the money comes from the foreman. Get 4*s*. a week. The mark in my neck (a large unhealed sore) is where a lad burned me. Was walking with a bottle of water to master when the lad ran against me. He couldn't help it though. It was some months ago. Have burns all over me, here (hands), here (on eyelid), and here (under mouth). We very often get burns. The glass flies so. When I get home at 1 I shall have dinner, wash me, and get to bed.

Was at day school till I came here towards a year ago, and go on Sunday. Can read the letters of "Dublin," but cannot sound it. Do not know what it is. Manchester is a town. (Question. Big or little?) Little. So is Liverpool. London is a little town. Big fish go on the sea. Cannot spell "sea" from sound. Wrote little letters on a slate. "9" is "3;" is "6." 3 times 7 is 21. Learned that at school.

[Very pale and ragged.]

92. *William Alcock*, age 15.—Been in glass-houses since 9 years old. We often get burned.

Can't read; know "one or two letters," not many. "f" is "k."

93. *John Andrews*, age 12.—Taker-in in the second turn. Am just come (12½ p.m.) Will leave at 7 and have supper, and be in bed by 8½. Up again at 11½ p.m., and come straight here by 12. Come so early because I have to go and call my master, who lives about 10 minutes off. At 4 a.m. will stop 20 minutes to eat, and get home just after 7. Will then wash me and go to bed, having breakfast first, and up again at 11½ or ¼ to 12.

At Sunday school a good while, but not to night school on Friday or Saturday. Can read (fairly). Cannot write, or very little; we never used to learn any sums or writing either, only reading.

94. *Edwin Simpson*.—Foreman in the larger glass-cutting room. In the glass business altogether 40 years, 19 of them here. The employment is injurious owing to the use of putty, which flies off from the wheel or brush, especially the latter which is used as much as the wheel, and can be seen plainly by the eye, but most in the sunshine. This cannot be prevented or the air freed from it. There are generally some of my men away from ill health; two were this week; but there have not been cases of the "putty drop" of the hand here. Always recommend them to be very clean, and all have nail brushes. Glass-cutters on the average do not pass 50 years of age.

Have never seen anybody hurt in the bands. The boys are brought to the work and accustomed to them and keep safe. One boy was cut badly in the hand by one, but that was his own carelessness completely. The band had a buckle, and as he was shifting the band in the proper way, pushing it with one hand, the tongue came against his hand and tore it. He ought to have fastened the buckle down better, and then it would not have hurt him.

Have now no apprentices under 18, though there generally are a few. Would not, however think of taking one before 14, as he would not be big or strong enough for the work. Though it may not appear so, it is very tiring to the wrist and wants strength. It does not hurt the eyes. A boy of 15 waits on the men in this shop, and occasionally tries at a frame a bit. The hours are from 6 till 6, with half an hour breakfast at 8½, and an hour for dinner at 1. The boy goes home for it. Have heard this boy read, and without spelling, and believe that he goes to school three nights a week. On Saturday all leave work at 1, and have done so for 10 years. This is a great boon to all. It gives time for recreation. There has been no overtime for a long while, not in the last three or four years. Overtime does not answer. It takes it out of the men, and the master loses not only on that account, but because the men, getting paid at a higher rate for it, like to have it, and hang back in the day time, making perhaps only 8 hours actual work in the day instead of 10.

95. *Herbert Rogers*, age 12.—Help the men in one of the glass cutting shops. Have lost an eye by an accident. Was "feeding up" for one of the men at the frame and in my proper place, when a bit of glass flew off and struck my eye. Had notes to the hospital, and the doctor said that I should have a little sight left, but not much; but I afterwards ran against something and hurt the same eye again, and so have quite lost the sight.

At day school for about a year two years ago; on Sunday sometimes in the evening, but not in the morning, as I am not up soon enough. Am going to take to a night school. Can read: "king" is "kind." Cannot write or do sums. It's been a great many years since I did them.

[By the account of a foreman (as he seemed) this boy's accident also was "entirely his own fault. He was standing too close." But "feeding up" required him to stand all but touching the frame.]

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MESSRS. STONE, FAWDRY, AND STONE'S FLINT GLASS WORKS, DARTMOUTH STREET.

96. *Mr. Benjamin Stone.*—These works were built upwards of 40 years ago for the manufacture of flint glass by the firm of Messrs. Bacchus and Sons, and I have been engaged in the works ever since, and am now senior partner in the present firm. Glass making is a very peculiar work, and requires probably more individual skill than any other general manufacture. The system on which work in flint glass-houses is conducted necessarily involves night work and a commencement of the employment at an early age, and in my opinion renders it impossible to combine a prohibition of night work of the young with the successful conduct of the business, though we are in favour of any measures for the protection of the young wherever they may be really necessary and practicable.

Our system of work in the glass-house is that which is, I believe, universal in the whole flint glass trade throughout the kingdom. The work is done by chairs or sets, consisting usually of four, occasionally of two or three more, persons, each chair working for 12 hours out of the 24, divided into two equal portions of day and night work, with an interval of six hours between. In our case the six hours begin at 6½ a.m. and p.m. for one set, and 12½ a.m. and p.m. for the other, beginning usually at 6½ a.m. on Monday and ending at 6½ a.m. on Friday.

The arrangement of hours arises naturally from the nature of the work. A certain time (in our case from Friday evening till Monday morning), is required for putting the materials into the pots and bringing them to the heat necessary to melt the material, and letting this down to the proper temperature for working, which is considerably lower. The remaining time is not more than sufficient for working out the metal, even with the nights included. Apart from this, the proper working heat when once got must be maintained, and unless the work is continued, the whole outlay caused by maintaining the heat during the cessation would be dead loss, and so heavy as to make it impossible to carry on the trade. If the heat were not maintained for the whole time, a like loss both of time and fuel would be necessary to restore it, as well as probable losses of other kinds from breakages of the pots, entailing further loss of time as well as loss of metal. A breakage of pots is occasioned generally by the fires having been neglected and the heat being attempted to be recovered hastily. The pots themselves are of considerable value, varying according to their size and the time and care expended in their preparation, which much diminish the risk of breakage. We calculate that one of ours of the largest size, holding 20 cwt., when fixed in the furnace and ready for use, is worth 10*l*. A furnace itself, from the time it is built till the time it is worn out, usually about six, sometimes seven years, is never let below the working heat day or night, unless for repairs or by accident. When worn out it is pulled down and rebuilt.

The system of chairs is formed upon the principle of a convenient and advantageous division of labour. The head, or workman, is the most skilled, and finishes work roughly prepared for him by the two next, the servitor and the foot-maker; the lowest, or taker-in being a boy who merely helps by carrying the articles when made to the lear, cleaning irons, &c., in the course of which he is gradually acquiring a familiarity with the upper stages, which is necessary to enable him to enter upon them successfully.

The work is too laborious to be continued for double the present period; and therefore men cannot work in alternate sets for whole days and nights, and have adopted the division of alternate 6 hours. Each chair does a somewhat different kind of work, and the members of it are incapable of doing any other kind, or at least satisfactorily. The man who makes a wine glass cannot make a decanter, and could not work so well with any but the persons with whom he habitually works. A youth therefore employed in the morning in one chair could not be employed in the afternoon in another chair; and if he could not work in the night set, could, in effect, only be employed for half a day; in which case he would seek other employments affording full wages, unless induced to stay by as high wages as he could get elsewhere.

Even if he did stay, his time of learning, which is already insufficient to give him the skill required, would be halved. The rules of the clubs or trade unions to which almost all glass-workers belong, do not allow of a boy being apprenticed before the age of 14. He could thus have practically only three and a half years instead of seven as he may now.

It of course sometimes happens that one or more are absent from work on account of illness or accidental causes. In such cases the remaining members of a chair are employed on such work as they are competent to do alone, which generally is of a kind more or less inferior, according as the person absent occupies a more or less important position. The absence of a taker-in is of no great importance; a taker-in from the alternate chair is put in his place, in which case the boy must of course be engaged during 18 consecutive hours, though he is not actually at work all the time; or else, as is generally the case, the others divide his work amongst themselves. The place of the other members of a chair cannot be supplied.

A scale is fixed by a general rule of the trade which measures the loss of work occasioned by one or more of the members of a chair being absent. The amount of work which should be produced in a given time by a workman and his chair is measured by "hundreds," *i.e.*, by the supposed number of hundreds of articles which he produces; though the actual number may be above or below a hundred to almost any extent according as the article is large or difficult, small or easy. According to this scale, the loss of work occasioned by the absence of a taker-in is fixed at 14 per cent., only 86 being required of the workman instead of 100, though, as the boy's work has been done by the men, they are paid for a full hundred.

Though the work of a taker-in therefore is not one requiring much trained skill, yet as it is in itself a training, it must be begun for a year or a year and a half, and sometimes as long as three years is required, before the stage of foot-maker can be entered on; and my experience is that a person will never acquire sufficient skill to fit him to be a "workman," unless he begins to be a foot-maker at 16 or at the latest at 17; and when he begins, it is indispensable, from the nature of the work, that he should work in the night set. I do not believe it possible, excepting in cases of extraordinary natural aptitude, for any person to learn the work properly, taking to it later than that age. It is true that those who do enter on it late have usually met with obstacles from the men not taking an equal interest in them, or caring to bring them on; and something of their failure may be attributed to this.

But as we find that young people are less careful, and of course less skilled, and do not, on the whole, answer so well as elder, we employ the younger in either the glass house or the cutting shops only so far as may be necessary either from the nature of the work, or the difficulty of obtaining elder; but in no case do we like to have them much under 14 or 13, though we may sometimes have a few boys younger. We employ no females in either department.

It would be better for boys under 13 not to work in glass-houses, if at all, more than through the whole of one of the day turns of six hours. It would be possible to get the 12 hours night work of the two sets of boys done by one set of adults, though it is work which they could not do any better than boys. But this would be at a considerable increase on the cost of their wages. In fact it would be men's wages for boy's work. The day work would be sufficient to

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give the boys the training required to fit them to enter the second lowest place in the chair. It would be essential, however, that there should be no other employments left open, in which boys of that age could earn a full day's wages; otherwise they would not work in a glass-house, unless for equal wages.

None but men are employed here in mixing the material, putting it in the pots, and attending to the fires. Our mixing is now done by machinery, which entirely does away with the injury to health which arises from the ordinary mode in which men beat and mix the lead in a state of powder with the other ingredients by hand. The lead, which flies off in large quantities, is inhaled, and settles in their bodies, producing serious and even fatal disease, apparently of a consumptive kind. I was induced to adopt the machinery, which I knew to be in use at one other place, at whatever cost, to prevent if possible the evils arising from our former method. But, considerable as the expense was, the work is done so much better, that the change already answers well merely as a matter of interest; and we would not return to the former mode on any account. But in addition to this, it has succeeded most effectually in preventing all injury to health. Our mixer is now quite stout, and one of the healthiest men about our works.

We consider the other parts of the glass-house work, notwithstanding the heat of the work itself and the risk which might be supposed to arise from subsequent exposure to cold air and the interference with the natural hours of sleep, to be very healthy employments. The muscular exertion and the expansion of the chest occasioned by lifting and extending the irons, which are a considerable weight, tend to develope the muscles and chest, and so to promote health. It is, I believe, a fact, that many prize-fighters have come from glass-houses. We have not known cases of colds or inflammation from chills, and I think that during the working portion of the week at least the recurrence at such short intervals of work involving free perspiration, is sufficient to throw off the beginning of such complaints, if existing. The chief evil arises from the temptation to drink. In this, as in all other respects of discipline, we have during the whole period of 20 years during which we have had the control of these works, been particularly careful, and we believe that we now have, almost without exception, a thoroughly temperate and well-conducted set of men, and that the best possible feeling exists between us. Though it is admitted that the regular night sleep is best for all, especially for growing persons, we do not think it can be said that the want of it has any serious effect upon the health of boys employed in glass-houses. With glass cutting, unless conducted with proper regard to the health of those employed, the case is different. The materials used in certain processes, as polishing and puttying, are injurious, consisting of putty, a mixture of tin and lead, calcined, and reduced to a powder, which, being light, rises beneath the face of the person employing it, and probably spreads to some extent into the surrounding air. This renders proper ventilation in shops where this is used of great importance. Other substances still more injurious could be used for the same purpose, and produce a better effect on the glass itself, but we do not think it right to avail ourselves of them.

Even as regards the moral effects of the glass-house work on boys, we consider, that by the way in which it occupies, either for work or rest, nearly the whole of the time in which the young are exposed to the greatest risk, it acts as a safeguard. The best safeguard is, of course, proper moral training and instruction; the intelligence and habits imparted by that and other instruction are likely to make persons so brought up more valuable as workmen also. When we had a larger proportion of boys than we have now, we provided them with evening school instruction in a school built for the purpose; but it is not worth keeping on for a small number.

97. *Stephen Bevan.*—Have polished and puttied for 23 years, and smoothed for 6 or 7 years before. In smoothing no putty is used, but in both of the other processes it is, and makes them the most pernicious job in the cutting branch of the trade. I should never have taken to it again had not my present place been offered to me when I was out of employment, and when I was too old to be clever at schooling in anything else. My club doctor, whom I often see, especially of late, always tells me to give up the work. Know others that have left it on account of their health. It is only at large places that it forms a separate work, but few carry it on for any great length of time, though I can name two or three cases of men who have been at it more or less many years; one an old man. This man, however, has suffered seriously, and one of the others gave up his work and became a watchman for some time, and got pretty well again.

The putty affects the nerves very much when it gets in, and makes you feel very low. It also makes you sick, "stakes" the chest up, and makes the bowels costive. When affected I take medicines, castor oil, and powder with "calomy." It also draws the hand, and my own hand (left) is drawn (*shows*), but I can use it. It came on four or five years ago, after a holiday, when I had played with a large bowl, and it has never recovered.

When I am puttying, either on the wheel or on the brush, the latter of which is much the worst, I wear a wet sponge over my mouth and nose, which I had heard from other glass men was a good thing. Before that I had used a handkerchief, but that was worse than being without it, as it is the breathing that does it; and putty will get a little even through the sponge. That board on the other side of the stone is put up to prevent the putty flying away, as it is valuable, and can be thus saved and used afterwards again. Live at a very healthy place out of the town, and think the long walk each way and fresh air must do me good. After work I always wash with soap and water, with sometimes a little soda. Washing is the grand thing.

98. *Edward William Elkins*, age 14.—Have worked here three years at smoothing, polishing, and puttying. Putty perhaps three or four hours in a day, or every other day, as may happen. Am not always well, but feel sick, and have headaches. Felt rather sick last night. Of late have had pain in my stomach, but not very bad; not to keep me away from work. Have not been away from work for some time. If I have cuts on my hands the putty gets into them and festers them.

My hours are from 7 till 7, with breakfast from 8½ to 9, dinner from 1 to 2, tea from 5 to 5½. Have my own meals down in the engine-house, but two of the boys stay and have them in the shop. Get 7*s.* a week.

Was at day school till 10 years old, at night school for a short time before last Christmas, and have gone on Sundays since I have been at work. Can read (not well), and write small copies, and sum.

99. *Henry M'Donald*, age 16. — Cut diamond borders on wine-glasses at a wheel. Have to watch very closely, and my eyes get tired towards night, but my sight is as good as ever. My eyes are not so tired by daylight as by gaslight. The gaslight is drawn down and placed close beside me. Have cut for 3½ years, beginning on cruets.

Was at day school several years till 10 years old, and seldom miss on Sunday. Father is going to get me to a night school, where I shall pay 6*d.* a week. It was father's wish, but I like it myself. Read the Bible and geography books at the day school. Paid 3*d.* a week there, but they put me in a higher class, and then I paid 6*d.*

[Intelligent, but not strong looking.]

100. *Joseph Lee*, age 12.—Taker-in. Here a month. Come to work directly I have had dinner, which I have at 12; leave at 6½ p.m.; get to bed by about 8; am called at 10 for my supper, and then sit on the

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sofa or anywhere till 12 p.m., when I come to work again, and stay till 6½ a.m.; then go home and get to bed directly; mother calls me at 10 for my breakfast, and then I go to bed again till 12, when I get up and have dinner. Cannot have breakfast as soon as I get home in the morning because mother is not up to get it for me. Can get to sleep always when I get to bed because I am tired. It sends you to sleep. Never fall asleep at my work here.

At day school for about two years altogether at different times, and go regularly on Sundays. Can read. (Reads "how" as "so.") Know all my letters.

> [Another boy had been at some small flint glass works, where small glass bottles were blown in moulds, and had the same hours there; there were only two boys in each turn. As I came away the machinery stopped and tea was being taken in the cutting shop.]

S. Robertson's, Flint Glass Maker, Brice Yard, Broad Street.

101. This place stands in a back yard, and is one of the few, probably not more than half a dozen, places in Birmingham called "cribs," a name given to small glass works in which a master himself works with one or a few small pots, and a proportionately small number of hands; in this case three men and two boys, takers-in. In places of this kind the metal is prepared in small quantities, and is inferior in quality to that generally made in other and larger flint-glass works, and there is a difference in the system of work, said to be owing to these causes: *i. e.*, the work is done in relays of 12 hours instead of six. The division of labour into periods of six hours, which forms the rule of the larger flint-glass houses, is said by manufacturers, for reasons detailed in their statements, to cause an insuperable objection to dispensing with night-work by boys or youths.

102. *Samuel Robertson.*—Make small common glass, such as cruets, &c. We work from 7 till 7, days one fortnight and nights the next, one boy in each turn. I always work days. Reckon half an hour to breakfast, an hour to dinner, and half an hour to tea; but we are not just regular. They stop about the same times at night, having an hour for supper at about 10. Know of five small places like mine in the town. They work by 12 hours in the same way; but most change the day and night work weekly. We begin Monday morning, or perhaps run till towards dinner time, and leave off about mid-day Saturday; sometimes an hour or two over. We keep filling as we go on, perhaps once or twice a day, according as the work is light or heavy, and uses up the metal quickly or not. Each time we fill it is not ready to work for 10 minutes or a quarter of an hour, sometimes more. The fire is never let out unless to put in a new pot when one breaks; but when not being used it is raked out and not kept so hot.

> [The taker-in, a boy of 14, could scarcely spell.]

Messrs. Gammon and Co.'s, Flint Glass Manufacturers, Brook Street.

103. *Mr. William Robinson*, a partner.—Our system of work in the glass-house is that which is general, or, as I believe, almost universal in this trade. There is, however, a short stoppage for food, and the work is not carried rigidly up to the full end of the period. There are, I believe, some exceptions to this system in small places where light articles are made, in which work is carried on only during the day; but these are so small and few as to be scarcely worth notice. In all other places the work must be carried on continuously, and would be too exhausting for the same persons to continue it for the length of an ordinary day's work. This no doubt is the origin of the existing division in periods of six hours. The lowest place in each chair must be filled by a boy, the work giving no scope for the strength of a man, whose wages, nevertheless, must be much higher. Even if men could be got to take such work it would be only the awkward or untrustworthy who are unable to obtain men's usual employments. If boys could be employed in the day only, the necessity of paying men in their place for the night would be equivalent to the imposition of a duty on the work done during that period. To make up for this by raising the price would injure the trade, especially as against foreign competition. Some foreign glass is already brought and sold here cheaper than the English is made.

It is perfectly legitimate to protect the young by limiting the total number of hours which they may work, but such a limitation ought to be entirely without reference to the period in which these hours may fall. For young children a half day's work with a certain amount of time spent in education, may be as much as they are fit for. A measure fixing a limit of age below which children should not work, and compelling the parents to educate up to that time, would be good. It is desirable that all should receive the groundwork of education. It would make them more valuable afterwards as workers. We should not care if the limit were fixed as high as 12, but that might not suit works of other kinds. The age of boys employed as takers-in makes no difference to us in point of cost. All receive the same sum, whatever their age, until advanced to the next stage of footmaker, after which their pay rises gradually.

Boys must be employed about the work for some time before they are apprenticed, as it enables them to acquire a knowledge, it cannot be explained just how, which turns to account as soon as they begin regular work. For instance, by handling the irons they have learned their weight, and they learn also by seeing the men as well as taking a man's place occasionally if he happens to be away, or in odd scraps of time.

The glass-work system requires that after a boy has once begun to work he should work the full periods of adults. A general rule prohibiting night-work of the young, though perhaps applicable enough to other cases, would be unreasonable as regards us, and I do not conceive it practicable.

The glass-house employment is more healthy than the glass-cutting. In the latter an ordinary day's work, from 6 a.m. till 6½ p.m., is all that is required.

> [The other partner concurred generally in these views, but saw "that there was a good deal to be considered on both sides."]

104. *Edward Shawe*, manager of the glass-house.—Generally take boys at about 10 years of age as takers-in. They move up to higher work at different ages, according to the opportunities of vacancies, and their natural quickness and attention. Became a footmaker myself at 14; but where one begins as early as that a dozen do not. In the trade generally the age for reaching that stage may be taken as about 16 or 17. Some, either from awkwardness, or from not exerting themselves, never get past being foot-makers all their lives.

The boys drop asleep at their work sometimes at night; but it is their own fault from not taking their natural rest in the day. Have seen men nodding too sometimes. The fire naturally draws you asleep. The boys come about half an hour before the men, to clean the tools and get ready. All are paid by the

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firm. One or two go to school on Friday and Saturday. Have not known accidents from burns. The work is healthy. One man died of bronchitis, but that is all.

105. *James Nicklin,* age 11.— Taker-in. At work at two places before; at one as errand boy, the other at a gun place. Work here with father. Sometimes am "figuring," *i.e.*, trying to see what I can blow. Come at 12½ mid-day and leave at 7 p.m.; then wash, have my supper, and go to bed, sometimes at 9, sometimes earlier. Up again and here by 12½ midnight. Breakfast here at 5 a.m. Home at 7 to bed, and up again by 12 or before; dine and come here.

At school on Sundays for two or four years, but at no other,—have not got no time, only at the latter end of the week, and stop at home and play then. Don't know all my letters; (after long looking, however, reads one or two words without spelling, and also some figures). Can write a very little; could hardly tell what.

106. *James Child,* glass maker.—My boy, 11 years old, who has worked with me here 14 months, goes to St. Clement's school on Fridays and Saturdays. He was a good lad there before, and when he left for work they told him always to come when he could get an opportunity. It is from his own choice as well as my wish that he goes. He can read anything, and do compound division, and is improving fast; it seems to me, almost more than when he was at school all the week. He used to pay 3*d.* a week when there regularly. He left work at about ¼ to 5 this afternoon to practice in a band, and gets another boy from the next set to come earlier and take his place, and will do work for him another time if wanted. The proper time for leaving work is 7, but we reckon not to work to the outside measure. A man could not wait on us so well as a boy; we could not manage him so well. The little boys are better than the bigger; the younger the better. The standing wages for a boy is 3*s.* a week, or with overtime, which however is made without exceeding the actual hours, and is generally made, 4*s.* 8*d.*

107. *Arthur Moore,* age 16. — Smooth, polish, and putty my own work; the roughing is done before by a man. Polish for 2 or 2½ hours or so at a time about twice a week, and putty for about the same, on either the wheel or brush. Have been at the frame 3½ years. Am quite well; can always eat; never have pains in my inside. The hours are from 6 a.m. to 6½ p.m., with half an hour for breakfast at 9, and an hour for dinner at 1. Have both of these in the shop, and so does the boy there (*next witness*).

Left school at 8 years old, when mother died, and was in the streets for a long time till I went to spoon polishing. Father never told me anything about going to school; mother did. Can tell my letters, but can't read. Never tried a slate and pencil. Cannot tell what number "IX." is, or how many half-crowns there are in a sovereign, or what 9 times 5 is; 5 times 5 is 25.

[Dull and ill grown.]

108. *Samuel Roberts,* age 14.—Wait about on the men, carry water, &c. Can always eat. Could wash in the "bosh" (box) there in which the glass is put.

Was at a night school for two months, but left it off because I had to work late. Was at wire weaving, and my proper hours were from 8 to 7, but often work was wanted, and I stayed to do it till 8 or 8½ or 9. It was till 9 only on and off, about two nights at a time, and about 9 or 10 weeks in a year. There were six boys there less than myself, and a little brother of mine, going 10, has been there a year and a half, and comes away at all times now, sometimes as late as 9¼ or 9½ p.m.; he does not go to school. Was at day school myself on and off, and go sometimes on Sunday morning, not in the afternoon. Can't spell at all; can read my letters.

[Small and ill clothed.]

Stourbridge.

Mr. Joseph Webb's, Flint Glass Manufacturer, Stourbridge.

109. This is spoken of as a manufactory of the highest standing. At the time of my visit to it, being Monday, the boys were not at work. The work and work-places, however, of this and the other flint-glass works which I saw in this neighbourhood, and at Dudley, are of precisely the same kind as others already described at Birmingham.

110. *Mr. Joseph Webb.*—Boys come as takers-in at 9 or 10 years old, but it is a pity that they should come too young; 11 or 12 would do very well, and I could do without any under 13. Indeed I should prefer bigger boys. Sometimes we suffer from their being too little and incompetent for the work. It would be a very good thing, very desirable, if it could be managed, to keep boys out of glass-houses and educate them up to that age, 13, and I should be very glad if it were fixed by law. Many men do not care about their lads going to school, but it is the duty of parents to take proper care of them up to that age. They would make better boys, and this is necessary as they are placed. They come amongst a lot of rough men, and get contaminated. Glass makers are the most ignorant set in the country. Twenty-five or 30 years ago boys were put to the work as young as 6 or 7, and scarcely one in a whole lot could write his name, but there is an improvement now. I hope that any measure for the benefit of the boys will succeed. Employers might see that boys attended school.

I have had several begin as foot-makers at 18 and 17, and not unfrequently these have turned out the best men. It depends more upon talent than anything else, and also I have always found that those who have been best educated have turned out the best workers. I do not know however that as a rule boys could begin so late; and the best age for the mass to begin foot-making is about 16. My experience is that it is best not to keep them long in different stages, but to put them on as soon as they are fit, and not keep them at foot-making more than a couple of years, and get them on as quickly as possible to be workmen, if possible by 21. The trade rule is that one apprentice may be put on for three chairs.

It is most important that all glass-workers, cutters as well as makers, should have their eye educated by attending schools of design. This is everything to them. Two of the best workers that I know have had the advantage of being taught drawing in this way, and I attribute their success entirely to it. I have sent many to such a school, and am now sending five. I have always taken a great interest in schools of design, and wish that some such education were adopted as a rule in this trade, and indeed in any. Drawing is a nice accomplishment in itself. But our trade depends for its success upon such instruction, and has been made so good solely by the improvement in design and instruction in it in the last few years. People themselves have come to appreciate beautiful things, and now nothing can be made good enough for them.

I have 12 boys takers-in, and four stickers-up for presswork, and have had double the number of the latter. The amount of work of each is the same. The work is not unhealthy, except for colds.

111. *Edward Compson,* workman. — Have been in a glass-house 32 years. Boys kept out of a glass-house till 13 would learn quite as soon as they do now; might learn as much in two years as they do now in five or six. If they could not learn enough as takers-in in two years they could not in longer. They

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must learn the work however by being takers-in before they begin to blow foot, and they should do this at about 16, not later than 17. There have been a good many made good workmen who have begun late, but I have seen some both ways, *i.e.*, beginning early and late. If a boy is a good scholar he will take it a good deal sooner.

[A boy of 16 here had been a taker in since 8 years old.]

MESSRS. RICHARDSON AND SMITH'S, FLINT GLASS MANUFACTURERS, STOURBRIDGE.

112. On the day of my visit, a Monday, no work was going on.

113. *Mr. Wm. Richardson.*—Our glass makers usually begin on Monday morning at 6 and go on in alternate turns of six hours till Thursday evening, sometimes till Friday, or sometimes they begin and end a day later. The glass-houses in the neighbourhood average about the same. In good trade houses would probably go from Monday till Friday. Sometimes pots break and hinder the work. We have only one boy in the cutting-shop. Females frost the glass.

Boys must work with the men in a glass-house, but I have no hesitation in saying that the work would be better done if it were done only in the day; and it could be if all manufacturers were to adopt the plan. The master too could superintend it himself. The men could work through the 12 hours of the day; other men do what is equal to it. There are a few kinds of work in which they could not. There would, however, be the cost of keeping up the heat at night; and it is a question whether the men might not suffer in health, and especially in their eyesight, from the longer continuance of work without rest. Indeed in hot weather they probably could not work through 12 hours, they scarcely can through six. On the whole I cannot see on which side the advantage would lie.

MESSRS. WALKER AND SON'S, FLINT GLASS MANUFACTURERS, STOURBRIDGE.

114. *Mr. Philip Walker*, a son.—We have eight takers-in, all between the ages of about 11 and 15. Eleven is the youngest age at which they come. Boys over 13 would do as well. We usually take boys as apprentices for foot-blowing at about 14 or 15. They could begin to learn this as late as 16 or 17, but it is better to take them when we do. In the cutting shop we have four cutters under 18, but no boys as errand boys or attendants. In the glass-house work begins on Monday night or Tuesday morning at about 6. Sometimes it begins on Monday morning, and goes on till Friday night or Saturday morning. At others it begins on Tuesday morning, and goes on till Saturday morning or night. The boys get meals as they can, and have perhaps a quarter of an hour or 20 minutes in the six hours. Boys work over sometimes to take the place of others who are away in the other turn, or if another or two are wanted for the press-work. The glass-cutters' hours are from 6 till 6, and in winter from 7 till 7, and till 1 on Saturday, with half an hour for breakfast and an hour for dinner.

115. *Thomas Russell*, age 14.—Taker-in. Was at school till lately. Can read, but not write very well. (Reads "distress.") Means, "When you got nothing "to eat." (Reads "Holy Spirit.") That means "Jesus."

[Another boy, age 15, was at school till 13, and can read and write.]

116. In a glass-house in some other works which I visited in Stourbridge, as in some other glass-houses, boys seemed exposed to greater heat than need be, owing to the arrangement of furnaces. Where, as in this case, kilns or lears are placed just opposite a furnace—only a few feet off, a boy is "between two fires" a greater part of his time, facing one, and with his back to the other. Great heat from behind seems less desirable than in front. My thermometer rose quickly at the kiln, where the boy places the glass to anneal, to the top, 150°.

MR. RENAUD'S FLINT GLASS WORKS, DUDLEY.

Dudley.

117. *Mr. William Davis*, foreman and manager of the glass-house.—This is the only glass-house now in this neighbourhood. There were either three or four some time ago, but the others are now closed. I have been here 14 years.

If I had my own choice I would sooner not have any boys under 13. If they had been educated up to that time they would take to their work better; but I do not see how the work could go on without boys under 18 working at night. It would be too hard and hot work for a boy even over 13 to take in for two successive chairs as a regular thing, so that, if prevented from working at night, he could only work half days.

Boys are not put on as foot-makers, except as apprentices. The rules of the glass makers' societies do not allow it, and the masters agree to keep to these rules. The proportion allowed since the last alteration in the rules is two apprentices to, I think, four chairs. (*But see* B., No. 156, J.E.W.) They are not often taken on much before 16, and perhaps it is not necessary to have them before that age. They wish, however, of course, to be as far on in their work as they can by when they grow up. Boys work over sometimes, when wanted for the press work, or if a boy is away.

118. *Edwin Hudson*, workman.—Went into a flint-glass house, Harris', Birmingham, (about the largest works there,—now closed) when just turned 7, not under my father. Was foot-maker by 11, servitor by 15, and workman by 22; am now 24. Did not go to sleep at my work at night, even when I was only 7; gave my mind to the work. If you went to sleep you would get knocked on the head, sometimes with the iron. Sometimes boys are knocked so and get their head cut open. They generally get knocked about. When you come to a glass-house you "come to a college." Have worked in other glass-houses at Warrington, Manchester, St. Helen's, and at a small place in Islington, London.

119. *Thomas Arnold*, age 14.—Taker-in. Was "gathering a foot" (*i.e.*, glass to make to a foot) just now. Often do so. Have worked three turns together. Sometimes could not keep awake. Catch colds.

Was at day school till I came here; *i.e.*, till about 11. Cannot read.

120. *John Wootton*, age 13.—Taker-in. Live with father and mother, but I call myself at night. Always wake very often. Sometimes might come down about $10\frac{1}{2}$ p.m. Should go to bed again then till it was time to get up; *i.e.*, an hour or two more. Can get down here in 20 minutes. Mother calls me in the day. Sometimes get some play when I get up, if it is before it is time to come to work. Get 4*s.* 8*d.* a week here.

Don't get beaten much, but sometimes a box on the ear when I spoil the work. Sometimes the glass cracks on the fork as I carry it, if I have let it wait too long. Have been bad two or three times since I have been here, not many weeks, with belly-ache and head-ache, and am rheumatic in the knee.

q.

Don't know "A ;" was never at school except on Sundays, and not 20 times there.

[Ragged.]

121. *Daniel Hawkshaw*, age 14. — Taker-in Usually leave off on Saturday mornings, sometimes on Friday. Work over sometimes ; not more than a turn at a time.

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122. The regular flint-glass manufacture is very limited in London, there being only two works generally spoken of as manufactories of importance, viz., those of the works of Messrs. James Powell and Sons of Whitefriars and of Messrs. Pellatt and Co. of Lambeth. These are conducted on the same system as those at Birmingham and Stourbridge. Flint-glass cutting, however, in London is a trade often carried on at the homes of the workers, on small wheels worked by treadle, or in small separate premises where power can be hired.

123. The works of the Messrs. Powell also include the manufacture of stained and painted or ornamented glass for windows, including the making up of glass into windows, called glazing. A few females of a superior class are employed in painting. Glass is also worked up into ornamental designs in mosaic and other ways.

124. There are, however, in London a great number of small works in which flint-glass of the inferior or commoner kinds, and cheap miscellaneous goods, such as cruets, inkstands, medical, perfumery, and other small bottles, bird-glasses, and many other kinds of small articles, are made. Some of these places employ only two or three men and a boy or two; many, not more than half a dozen men and three or four boys, which is represented as about an average size; some double this number or even more; while some approach to the character of a manufactory. The number of these small works according to the estimates given to me by a number of independent persons acquainted with the trade, including the secretary of the London flint-glass blowers, is little, if at all less than 50, possibly more, and the number is represented as increasing. From one source alone I was furnished with the addresses of 27, and at some of these learned of others not included in the list.

125. Most of these are in the poorer parts of London, *e.g.* the Borough, Lambeth, Whitechapel, Shoreditch, and other parts; I visited a number of them. Some of the smaller, in their character and that of the workers and in the situation in which they are found, much resemble the lucifer match manufactories of the poorest class. Very little capital can be required. Material is obtained by melting down old broken glass. The furnaces are very small. One, where "Jews' work" is done, which was explained to mean that it was of the cheapest kind, and such as only the poorest people would use, and very poorly paid, consisted merely of one side of a shed, the other part of which is used for another business, not separated by a partition. The skylight was out and part of the roof off. Work goes on in it only at times, *i.e.* when there is work to do, and employs at the most four men and two boys. Others were up alleys or stable yards, one in what I was informed is a noted thieves' quarter. Certainly the appearance of the neighbourhood and of the people sitting about at their doors, apparently with nothing to do, was wretched enough.

126. The system of work at these small places is not that above described as usual in regular flint-glass manufactories, but the hands work for periods of 12 hours instead of 6 for five or six days in the week, in most cases by day and night relays, changing each week, as in iron works, or less frequently; in some, by day only. The chief cause of this difference of system is said to be the smaller size of the pots, and the inferior nature of the work, which does not require equal attention to the quality of the metal.

127. The views of one of the firm of Messrs. James Powell and Sons, who is a magistrate for the county of Essex, and with whom I had more than one conversation on the subject, as well as visiting his works, are sufficiently expressed in the following letters written to me a considerable time before :—

128. White Friars Glass Works,
Temple Street, Fleet Street,
London, 7th August 1863,
E.C.

MY DEAR SIR,

OUR manager has been away, and there has been a delay in getting the list of names and ages, and I am glad to find that our rule (for many years) of having no boys under 13 has been kept to, though I believe the men working here get *their* boys in as soon as they can. The rest on the Friday, Saturday, and Sunday, I think quite makes up for the *broken* nights. We could not do without the work at night, as we only charge our pots once a week, and the glass must not be disturbed, or the steady heat of the furnace interfered with, while the glass is melting (from Friday till Monday morning), and then the glass must be worked out ; and if we did not work at night there would be the heat of the furnace and ovens wasting ; and only a certain *number* can work at the furnace at a time.

I shall be very happy to answer any questions you may require, and if you will call here, when in London, I should like to show you over this place.

Yours very truly,
J. Edward White, Esq. NATH. POWELL.

129. Whitefriars, E.C.,
London, 15th September 1863.

MY DEAR SIR,

WE have found no injurious effect to the boys from working at night. Those men we have who have worked up from boys are healthy and strong. It is not only the wages, though to charge on each article made the pay of three men and a boy is a hindrance to cheap production, but the boys act very much like fags. They do the cooking, run for beer, clean the tools, &c. ; and I have no doubt the discipline is of benefit to them in after life, for as they work up they must work *under* the gaffer or head man, and obey directly the slightest sign to give him help when he requires it, or the article is spoilt. The second man is called the servitor. I cannot fancy that lads of 16 would do the odd jobs necessary, and it would end in quarrels and confusion ; also, in making some things, two boys would be employed in taking in, to get the things *quick* into the lears.

I think I said before that the rest on Saturday and Sunday, and frequently Friday, and always Friday night, quite does away with the hardship of working every *six hours* on and off.

Yours very truly,
J. E. White, Esq. NATH. POWELL.

MR. JACKSON'S, FLINT GLASS MANUFACTURER, LANT STREET.

130. *Henry Benham*, flint-glass blower.—I began the trade at 8 years old in one of the leading London flint glass manufactories (Pellatt's), and have worked in, I should say, a dozen of the small flint-glass works in London, and am acquainted with men who work in a great number more. I know of about 26 such small

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works, such as used to be called cribs. Some are on about the same scale as this place, viz., three men and two boys, but most are larger, having as many, say, as from eight to ten men and boys. Boys begin usually, I should say, at about 10 years old, some as young as 8, but I do not remember seeing any younger. In small places like this the pots hold on the average about 1 cwt. 3 qrs.; there are three of them here. In large works the pots usually hold from 18 cwt. to a ton each, and where I was, each of the two furnaces had 10 pots, besides two or three smaller pots for coloured glass. The number of small work places is increasing, I think, because any man who has a little money to himself and knows how to blow glass likes to set up for himself.

In all the small works the practice is to work in turns of 12 hours for five or six days and nights, beginning at 7 a.m. on Monday, and taking about half an hour for breakfast and an hour for dinner. Those who work in the night one week work in the day turn the next, because we all take our night's rest. There must always be some one to stoke or mind the furnace every day and night in the week. In the small places it is often a lad that does this, but in the big, men do it. The large works, of which there are only two now in London, work four days and nights by turns of six hours. I have worked the six hour turns in large works, but I like the 12 hour turns best. You want eight hours sleep at this work, but with the six hour turns, what with getting home and washing, and having a meal and getting up to come to work again, you cannot get nearly six hours sleep at a time. I believe that there is not a class of men who work harder than glass makers, what with the heat and their hours of work. You cannot tell when you have done. I have got this crucible now to work out to-day (Saturday). It may take me till 7 or 8 to-night, or it may be till 11 p.m. The boy, who is about 14 (No. 131), will have to stop with me. A young man who came on here yesterday morning at 9 did not leave till 10 this morning, and working hard. Many a time, even while I was a boy, I have been on 48 hours at a time in these small places, till I could hardly hold my eyes open, and I have been that way so as I could not sleep because I was overtired. I was forced to do it, and very often worked a turn over, it might be two or three times in a week, or might not be more than once in a month. I have worked 48 hours together too as a young man of about 21, and thought nothing of it, but I have not done it since, *i.e.* about 15 years, and wouldn't. I find 12 or 14 hours quite as much as I care about now.

The work is unhealthy from the sulphur which comes from the furnace. There is always black filth and stuff comes off your stomach if you cough in the morning. That is the only thing unhealthy in it except the blowing, which affects the chest. I find it in my breathing, and any one must who is not strong. But some don't find it. I often cough, but I do not lay it to the work, but to my being a little consumptive and asthmatical. Though I am slight I was always strong and healthy unless I brought anything on myself by not taking care of myself, as in drinking. If you have been drinking and stand over the furnace it will get into your head. If, however, glass makers are not strong they go off young from decline; plenty do.

The work is not heavy, only fatiguing, and at times very hot. Bless you! if any one came in here in summer they would see the drops coming off like great peas. The big glass houses are much cooler than these small places, being much higher and having more draughts. In these small places we are nearer the furnace, and have not so much room to work in. Our work is on the same sort of footing as the gas factory stokers, only theirs is heavier work. I never yet saw a glass-maker carry any flesh, *i.e.*, real solid flesh. Some are very fat, but that is only from being bloated and puffed out, partly perhaps from the beer which they drink. It is not healthy fat.

Many of the glass makers do not get much teaching. I did not. At Pellatt's works there is a school, or was a year or two ago. I have seen men who could not read their own labels. They showed me a book, but I could not make out what was in it.

131. *Edwin May*, age 14.—Began this work when between 10 and 11 years old, and have worked at four small places like this. Am taker-in; do other work to help the man. My work hours for the five days of glass making are (*as above*). Besides this, I have to mind the furnace. One week I work all the six days, and the other week seven nights. Come on at 7 on Sunday night, and so every night through the week, and finish at 7 on the following Sunday morning. Do not go to bed then but keep up for the day, as I go to bed that Sunday night and do not begin again till Monday morning. Do not ever work on the day of Sunday; this chap (a man) does that. Get 8*s.* for the six days, and 9*s.* 4*d.* for the seven nights. When I am on the nights I have no real sleeping time, but can lie down and dose a little, and then wake up and see to the furnace. Can trust to waking; the noise of things going by would waken me. Have worked 36 hours together, *i.e.*, one turn over, but never more at any one time. May do it twice in one week perhaps, and sometimes perhaps be a few weeks without working over. Had the same hours of work as here at the other places where I have been.

It is warm when we are working, and makes me sweat, not so as to make me wet, but only just muckified. Have to stand up close to the furnace to gather metal for the man, but only just for a little while each time. Like the work best in winter. Do not feel chilly when I go out if I am wrapped up warm. Wash when I get home.

Did not go to school much; wanted to come to work. Have been since, on Sunday now and then, and a few nights, but not lately. Left it off I think because I got lazy about it. Can read, and write my name. (Can read only one or two monosyllables out of a number.)

[Intelligent and tidy, but has a glass-house boy's complexion.]

J. Crook's, Flint Glass Manufacturer, George Yard, Whitechapel.

132. *Mr. Frederick Porter*, manager.—We make small medical and perfumery bottles of flint glass. Men are required to make a certain number in the day, according to the size of the bottle. The highest number, which is with the smallest bottles, is 12 gross but we expect 15 gross at least, and they could make 18. Usually three men and two boys work by day, and the same number by night, in the usual 12 hour turns. The youngest boy is about 11, and gets, say, from 4*s.* to 5*s.* a week.

133. *Joseph Lock*, age 14.—Knock off and stick up bottles. Hours (*as above*). Have worked over only two or three times since I have been here, *i.e.* a year. Get 6*s.* a week; give aunt 4*s.* 6*d.* and have the rest for my clothes. Worked at another place (Bibby's, then in Moor Street) about this size before, and had the same hours. The day set began at 7 a.m. on Monday, and finished at 1 p.m. on Saturday, but the night set always worked Saturday night till 7 a.m. on Sunday, men and boys. Strangers would often come on to work on Sunday night, but the same boys would have to go on with them. Every other Sunday then I minded the fires from 7 a.m. till 7 p.m., and another boy did it the other Sunday. Got 1*s.* for it and all my grub, breakfast, dinner, and tea. Two or three times worked Sundays together.

I once worked there five days (turns) running, all but six hours. It was from 7 on Saturday morning till 7 on Monday evening. On Sunday was helping the men put the feet on doctors' glasses, and taking into the lear. Didn't like it at all. Was so tired I could scarcely stand up. Went off at 1 p.m. on

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Sunday, but did not go to bed, as I should be going to bed at night. Played about, and was just getting to bed at 7 in the evening when they sent for me, because the other boy had run home and would not work. He was twice as big as me. I should not have got up but for the man coming to fetch me. Was about 12 then.

At that place I always worked in the day turn, and so another boy had always to work in the night turn. It was because I worked with master, and master always worked in the day turn. I worked better than the other boy. Sometimes worked half of the night turn too and another boy the other half, if one was away, and sometimes had to work in the night turn without another boy being away, if the work was of a kind that wanted it. At another place there were only three men and two boys, and we only worked in the day. At taking-in my feet have ached frightful sometimes, and been sore, but not blistered. Have seen boys hit with the iron or the hand because they did not do their work properly; hit just to feel, not hurt or knocked down.

Was never at school except two or three times. May have been in chapel sometimes. Know my A B C. Can't go on. B comes next I think, not D. Have not heard of the Queen, and can't tell anything about her. The Prince of Wales is a soldier, I think.

[A clever, self-possessed boy.]

Mr. Thomas Pope's, Flint Glass Blower, Nichol Street, Shoreditch.

134. *Mr. Thos. Pope.*—On the average I employ six men and four boys, but we have not always work going. I have more hands to work in the day than in the night turn, because it is more healthy for the men; the hands change turns every week or two. We leave off at 2 p.m. on Saturday. If I knew that a boy would be away, say to-night, I should try to make his place up by letting one go at noon and come back in the evening and work till midnight only, and then have another, so as not to destroy a boy's rest altogether. At some places they work anyhow, and take no care of a boy's health. There are, I should say, 50 flint-glass places of this kind in London.

All the men seem to prefer the 12 hours turn to the six hours, which is the rule in the large works where many of them have worked. I worked the six hours many years in Pellatt's works, and thought that I should find the 12 hours much harder, but on the contrary, it is much better, and I think that I shall live several years longer for it. The reason is that with six hours, with perhaps half an hour for getting home, and the same back again, with meals, dressing and undressing so many times, &c., you don't get four hours' sleep.

The work in large places is much harder for boys. I was a boy myself in one. Owing to the kind of work done there, there are so many more things for boys to do, seven different things, say, in a simple kind of wineglass. Then the distance which he has to carry the things in taking-in is so much greater. We used to count sometimes how many miles a boy had to walk in the turn. In some kinds of work, such as making common (flint glass) bottles, it was I think as much as 16 miles in the six hours. A boy would have sometimes to take in 800 things all across a large glass house, *i.e.*, a good many yards, and the same distance back. In one place they had at times to take them out into another house, which was further still. It is not walking then, it is running, and I know it too. At times, especially in summer, when the heat is greater and the stones in the floor get hot, the boys feet are very bad, and they are obliged to what they call "lose a turn," *i.e.*, be off work. With the stones being so hot and the perspiration in their socks and shoes, especially if their shoes are old or thin, they get blisters on the bottom of their feet and between the toes. But a great deal depends on how they are looked after, and whether they have a good mother who keeps them clean and gives them good shoes. Good food too makes a great difference. Some boys have no victuals, and some are half as strong again as others. Some improvements, however, have been made in having kilns nearer and carrying off two things at a time, or several in a tray, but best work must be taken in at once.

Besides doing so many little things, a boy has to keep count by scoring the number made, and if he misses any he gets something for it. Altogether in a big place there is so much to do, and boys are kept so close to it, that six hours' work there is more work than 18 hours or two days almost in a small place like this. It is not work for a boy so much as for a man, or at any rate there should be two boys instead of one. Men could do it, and I have known some almost men, or 18 or 16 years old, do it, but men would not like it. They would not get a living at it, and it leads to nothing. Besides when boys get big they want to be learning the trade.

The chief thing for health in glass work is to keep the place quite clean, and have no dust or sulphur about. Of course the work is hot at times, and in summer I have known men turn faint and obliged to knock off. I fainted myself once. My place is large for the number in it, but if it was as large again I should like it better for health. But there would be more rent than I could afford in the town, and if it were out in the fields I could not get the things. If I took an old shackly place there would be draughts, and the men would get the rheumatics. Since I have been in the trade I have known a hundred glass blowers die; I am now about 41. When a man's health fails he gets weak, and I have known several have the dropsy. In some work, as in making wine glasses, or work which a man has to watch very close, the eyes fail very much, at least so far as to make him unable to do work of a good kind. But a great many who die or break down, bring it on themselves by not taking care of themselves. For instance, instead of going home to bed after work, some will lie down on the coke and all amongst the smoke, and then the draughts come in and they get the rheumatics in their bones. Then at the end of the week, instead of going out and getting a walk in country places, some sit and drink in a little public close by. After working in a factory all the week a man should go out and get fresh air, as some do. It must be much better for them. Many get great fat men and bloated. That is from drinking such a tremendous lot of beer. Beer is I think the best drink at this work. If a man is working very hard he wants something more than tea or coffee, but then he should drink beer only in moderation.

That boy there (No. 135) always has that cough. It is in his family I think; his brother has one. When a boy is like that he is best away. About 16 years ago the doctor told me that if I did not leave off the work I should not live, but I had nothing else to go to, and I am better now.

The boys are coming on to be better treated now. Masters look to it more and won't allow bad treatment. I allow no man to touch a boy here, and if one did I should tell him that I was the proper person to correct any faults in the boys, and tell him to go about his business. If you once say that, they understand. Some years ago it used to be dreadful. Men used to knock the boys about and the boys would run away. I have seen men knock boys down and hit them with the iron or tools, &c., *e.g.*, if the boys did not come up right to their work. I have some nasty cuts on the top of my head now that I got when I was little, but I did not get knocked about much because I generally worked with my own relations, and they took care of me. I began very young, perhaps about 8. The language too was awful, not at all fit for boys to hear. Some could hardly open their mouth without swearing. It was not London men so much as those who came up from the country

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glass making towns, who ill-used the boys and used the worst language. They were so uncouth. Speaking generally the men are better now, and encourage the boys more, giving them halfpence instead of ill-using them.

135. *Charles Raynes*, age 12.—Taker in. Have had this cough a long while. It hurts me in my chest. Have been at work in a glass house 3½ years.

136. *Martin Robinson*, age 15.—Stoke the furnace and take in. Work a fortnight of days and a week of nights, all the days except Sunday and all the nights except Sunday night. When I go home from work at 6 on Sunday morning I sleep till dinner time. Before I came here, eight months ago, I had worked at home at making throw-down crackers since I was 8 years old, and usually 15 hours a day, viz., from 7 a.m. till 10 or 11 p.m., generally after 10. There were, however, no regular hours fixed. Father kept about 20 girls, from the ages of 16 or 18 to 20, and a couple of boys besides me at it. Since he died my brother has carried on the work in the same way.

Could read a little once, but can't read at all now. Used to go to night-school sometimes when we were not busy.

137. This boy (No. 136) was pleasing mannered, and by his master's account "the best boy about "the place. If he does well, I shall try and do something for him." In speaking of his father, who died six years ago, his eyes filled with tears, and when I had occasion afterwards to put a question about his father, the same happened again. I could not make out any special reason, such as unkind treatment at home. Such feelings deserve better opportunities of cultivation than have fallen to his lot.

SKIDMORE'S, FLINT GLASS MANUFACTURER, DUKE STREET, STAMFORD STREET.

138. *Charles Richardson*, age 10.—Taker in. Another boy and I always work in the day turn from 7 a.m. to 7 p.m. taking in. Two others about my size always work in the night turn. They do so because the master took them on purpose to work so. Once since I have been here,—six months,—I worked on from 7 Friday morning till 7 Saturday evening. Lay down a little on anything I could. At some other small works, but larger than these, I often worked half a turn over, sometimes three nights a week, as Monday, Wednesday, and Thursday. That would make my work each turn from 7 a.m. till the 1 a.m. following, and I should come on again at 7 a.m. Got 6*d.* for half a turn over. When I work over my legs ache. Often burn my hands in cleaning the irons. Get 4*s.* a week.

Was not at school much, only once or twice before I went to work. Cannot read. Forget all that I ever learned.

> [This boy's father, I was informed, is a compositor and "first class workman, "getting 2*l.* or more a week, but a great "drunkard."]

139. *John Baldwin*, glass-blower.—Give me Scotland for education! I will be bound to say that in Scotland, out of 20 men together in any class that you go into, you will find 15 intelligent men, and in England out of the same number 18 would not know anything. In Scotland the great pride is to bring up the eldest son to college, though the father may be much poorer than an English working man. I am not Scotch, but I have worked in Scotland. Education is more neglected in England than anywhere, and in London than in any English town that I know, or even than in little country villages. I began the trade 30 years ago, and have worked in it in Manchester, Liverpool, St. Helens, York, Bristol, Plymouth, Edinburgh, Glasgow, and Greenock, and have lived a time in Exeter, where there is no glass-making. At York there is now a large flint-glass factory; the hands work the usual six hour turns in it, and they did the same at Plymouth when I was there 16 years ago, and they do so in all the large factories. In small places 12 hour turns are the rule, because the pots are small. I find that 12 hours suits me best, because you get more rest.

The distance which a taker-in has to go in a large place comes to many miles in one turn of six hours. The distance to the kiln is in some cases, I should say, near 20 yards, and the same back, and with some work 400 articles will be made in the six hours. That distance, however, is an extreme one.

I have never seen a healthier or more active set of men than glass-blowers. Some at 60 are as nimble upon their legs as many mechanics at 40. My father worked in the trade till he was 73. Of course you must not go out too long in the air so as to get chilled, and there is no denying that it is hot work in summer.

J. HOCKING'S, FLINT GLASS BLOWER, ALLEN STREET, GOSWELL ROAD.

140. *Joseph Hocking*.—My son and I work here by day with two boys of about 13 to help, and a youth of about 17 blows bird glasses by night with a boy of about 14 to help him. Now and then we give them a change. I reckon that there are about 50 places of this kind in London. A few years ago I remember counting 46, and five or six have started since. The age at which boys are taken to work in them depends on how poor their parents are. I have seen some at 7 years old. In all the small places work day and night by 12 hour turns is the rule. I worked 18 years in the Whitefriars flint-glass works, where we had 6 hour turns, and my father worked there before me. I would sooner have the 12 hours because you get more rest. When you work 6 hours on and off, by the time you have gone a mile home and have a bit to eat and just a little sleep, you have to be up again. Yoo want rest because it is fatiguing work, especially in the large places. Prices have sunk so that men now have to work so much harder than formerly to make enough money.

141. *James Basset*, age 12.—Just come. Worked at home before, helping father, who is a glass-cutter. He cuts decanters and goblets and all sorts on a wheel which he works with a treadle. I polished punties, *i.e.* smoothed off the punty marks on the bottom of squats, *i.e.*, small inkstand glasses, on a wheel which I worked in the same way. Had to hold my arms up, so. Began work at 8 or 9 in the morning and gave over at night at 9 or 8, and all manner of times; never much after 9.

Was never at school. Can read, and write my own name, but no more; only spell a few little words. Went to chapel a few times with my little sister, but don't go there or to school on Sundays now. Stay with father, who has to get the dinner ready now, because mother died.

> [A taker in, aged 13, and getting 5*s.* a week, could not read.]

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142. *Emma Golden*, Cowcross.—My father-in-law is a flint and green glass-blower, but his workplace has been taken by the railway lately. As soon as he can get another shed somewhere he will carry on business again. He had about eight men and four boys. They work day and night in 12 hour turns, changing turns each week. They begin at 7 a.m. on Monday and finish late Saturday night, usually 10 or 11, sometimes into Sunday morning.

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MESSRS. E. MOORE AND CO., FLINT GLASS MANUFACTURERS, SOUTH SHIELDS.

143. The kind of work, viz., pressed flint-glass making, is the same as that carried on at the large works of Messrs. Sowerby and Neville in Newcastle-on-Tyne (Nos. 153–155). The glass-house which I first entered was dark and filled with a strong sulphurous vapour, said to be drawn into it by the strong draught of the furnace from some other furnace or kiln in the process of heating. One of the boys spoke of the smoke as a cause of his cough.

144. Owing to the size of the furnace in the centre of one glass house, which I took the measurement of, the distance which must be walked or run by the takers-in from the place where the glass is finished, &c., to the lear where it is annealed, is often very considerable. When the holes on the side of the furnace farthest from the lear are being worked at, it is about 18 yards; those on the near side are quite close. Somewhere about 10 or 11 yards would probably be a fair mean distance. The distance is doubled each time, *i.e.* in going and returning.

145. The number of pieces made by a chair in a turn of 8 hours varies with the kind of things being made and the pace of working; but with good work it should average, I was informed by the manager, 900, or at any rate 800. He had, however, known as many as 1,400 small tumblers made in the time. Taking the mean distance, the lower number 800 would give the taker-in over 9 miles walking or running, and taking the extreme distance, would give over 16 miles in the 8 hours. If a large number happened to concur with a long distance, as it might, the result would of course be greatly increased; *e.g.* the exceptional number of 1,400 with the extreme distance would give the total distance of more than 28 miles. But it seems hardly possible that this could be done in the time, and the coincidence of the two extremes, if possible, would be improbable, and if it happened, extremely rare.

146. The "stickers up" have to stand close in front of a furnace holding glass to be heated afresh after being pressed. It is very hot work and they complain of it (No. 149).

147. A small building or shed in which some girls and young women were washing glass, which was put to dry on a hot steam plate, was full of steam and moisture. I was informed that this must be accidental, owing to some escape of steam, and that it was intended to build a larger and more airy washing room, which would be much more suited to the work.

148. *Mr. E. Moore.*—We make pressed flint glass. We have two glass-houses and are building a third. We employ now upwards of 200 persons; about as many out of the glass-houses as in them. Of those not in the glass-houses some are men and women who are employed in the mixing room, where the materials are mixed with shovels, and others in the pot lofts making pots. A number of big girls and women wash the glass, others wrap it up in paper, or do warehouse work. There are a number of apprentice boys in the cutting shop, and a few boys who clean the moulds in which the glass is pressed, and which soon become dull and require rubbing with rag and emery. This must be done very frequently to keep the moulds fit for use. All these hands out of the glass-houses work by day only, viz., from 6 a.m. to 6 p.m., with the usual hour and a half for meals.

In the glass-houses the work is done by relays working eight hours each. There are eight chairs in each house, and on the average six persons to a chair, *e.g.*, to take an average set, a taker-in, two stickers up, a gatherer, a presser, and a melter. The three first or lowest in the chair are all boys; the gatherer sometimes so, sometimes not, but generally as old as 16 or more; the two highest are men.

We employ some young boys because parents are reluctant to pay for their education or to spare their earnings, and we find that children, as a fact, can do the work. But we could do without any under the age of 13 or 14. It would be a very wise and merciful arrangement if manufacturers would say that they would take no children under 13; that is quite a low enough age to fix. The glass trade generally could not suffer from this.

There is no particular reason why we should work by relays of eight hours in our branch of trade, viz., the pressed flint glass, instead of six, as in the blown flint glass. It could be 12 hours equally well. But 8 is the established number. If I were to propose 12 instead, the men would merely think that I had some object for my own interest in view, so I should not do it. In one way it would be better, as the work-people would have the great satisfaction of getting a night's sleep in turns.

Work begins at 5 a.m. on Mondays, and generally stops at 9 p.m. on Tuesday or 5 a.m. on Wednesday for 16 hours; and generally also for a time between then and Saturday morning, when it finishes. The metal however is always being got ready, that in some of the pots being in the process of melting while that in others in the same furnace is being worked.

The children of English workmen generally are very much behindhand. I have no doubt that this is why employers get such wretched workmen. There ought to be some measure for general compulsory education. For a time I tried to get my people to a reading room and paid their subscription, but I am bound to say that it was a failure; most could not read enough to take any interest in it.

In my view there is a question more important than the employment of the young—I mean the employment of women in factories. It is a great pity, because it has a great effect on the health and bringing up of children.

I have often thought that in one way there is an advantage in night-work. It removes peoples more from temptation. We pay a doctor for attending the apprentices, and in fact all the young people.

Boys in a glass-house, I am sorry to say, are very badly treated. The men are brutal and have horrid tempers. They often knock the boys about, *i.e.*, kick them, cuff them too hard, and perhaps make their mouth bleed or something like that, though I do not know of any serious injuries being done. We do all we possibly can to prevent it, and once or twice I have myself got a summons taken out. Such treatment is nothing peculiar to our glass-houses, but is practised in others as well.

149. *Alexander Dickson*, age 13.—Sticker up: here two years. We have to warm in at a hole, *i.e.*, hold the glass on an iron to heat in a furnace. We're awful hot at times and sweating very hard. It suits a few, but a vast lot have had to leave through the heat or would like to, but two or three have been fetched up for it in the county court, so we must stay. If it is a large thing, such as a dish, we have to stand a minute and a half to warm it in. With standing before the heat so, and then drinking cold water, your head turns a kind of dizzy. If we could get a chance of it we would always be drinking pretty nigh. Many of us catch colds, but it is our own fault for not taking enough care when we're out in the night (*coughs*). Sometimes the holes gets full of smoke and makes us cough. Sometimes I am hoarse and cough through the night.

Get about six hours' sleep at a time between the turns, and can sleep well. When you come to work at 9 at night you are very sleepy, and have to sing to keep you awake, and the same in the day sometimes. It is through the heat. When we have done work and get home, we feel quite fresh, and as if we could work another turn; but it is only feel, you know.

After the regular work is finished we are forced to

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come again Saturday morning from 6 till 9 or from 7 till 10 to do odd things, and are fined if we don't.

150. *William Mather*, age 13.—We work in turns of 8 hours on and 8 off. The first turn begins at 5 a.m. on Monday, and the turns change each week. We stop a turn each in the middle of the week and finish by Saturday morning at about 4 or 7 o'clock. We stop half an hour in the turn to get meat. When a lad belonging to one turn is away they get a lad from the other turn to work over in his place. I don't do it; I've enough to do to work my own turns. They just ax you "will you work over?"

151. *William Carr*, age 11, taker in.—Have only worked a turn over twice in the five months that I have been here. Get very sleepy then. The mark by my eye is from a burn from a bit of metal; have burns on my legs too.

152. *Robert Smith*, age 10, mould cleaner.—There are six of us, all boys. We rub the moulds with emery and oil. Work from 6 a.m. till 6 p.m.; sometimes make a quarter (of a day) over till 8 p.m.

[This boy and another of the six could not read. No. 152 was the youngest.]

MESSRS. SOWERBY AND NEVILLE'S, FLINT GLASS MANUFACTURERS, NEWCASTLE-ON-TYNE.

Newcastle-on-Tyne.

153. *Mr. Neville.*—We are the largest manufacturers of pressed flint-glass in the kingdom. This manufacture has been very greatly developed in the last few years, and chiefly by our firm. This kind of glass differs from the blown in being made by machinery, and thus to a great degree independent of skilled labour. We employ about 450 persons. The materials are mixed by machinery, which prevents the injury to health which results where they are mixed by hand, which I believe is almost universally the case. I know of no other firm which uses machinery for this purpose.* The materials are stored and prepared in a separate part of the building, and conveyed from thence straight to the furnaces in a way which secures the workers from any noxious dust or influence.

Our glass houses are, I believe I may safely say, the best in the kingdom. It is not at all necessary for glass houses to be, as they are commonly supposed to be, and often are, hot, gloomy, and dirty work places. Ours is cool and well-ventilated, light, clean, and in every way as comfortable and healthy a workplace as can be desired. One means by which we obtain this is by having a large opening over the front of each hole, where the glass makers stand to take the metal from the pot, leading up into the cone. These make such a draught as to cause a constant supply of cool fresh air, and at the same time make the furnace draw better. Generally they are not so large in opening, from an idea that they cause a loss of some heat, but the gain from using them is on the whole much greater than the loss. We have eight furnaces, all with the best modern improvements, which tend greatly to secure regularity in founding the metal.

We have a different system of hours from that which prevails in blown flint-glass houses in this country. Our glass makers work in turns of eight hours instead of six. We were the first to introduce this plan about 12 years ago, to do away with the inconvenience of having the hands change in the middle of the night. It also saves time by diminishing the number of stoppages for changing. Work begins at 5 a.m. on Monday, one turn beginning first one week, the other the next. By the middle of the week the metal is worked out, and an interval of 16 hours occurs for filling the pots with a fresh supply and founding. The second lot is always finished by Saturday morning at 5. Thus the hands in each turn get three clear nights' sleep in the week, which is a great advantage to them.

The system of eight-hour turn answers much better than that of six hours. There is nothing in the pressed-glass manufacture which makes the arrangement more applicable to it than it would be to blown-glass making. The six-hour system prevails simply because it has always been the custom, and the men object to altering it; and on this account manufacturers generally do not care, or perhaps are not able, to alter it. Our men at first objected, but we insisted on it.

In each turn there is a stoppage for a meal. It is, however, necessary to keep the work partially going in this interval, to prevent the moulds from getting cold.

The work of boys in our glass-houses is much the same as in blown flint glass-houses. We do not like to take boys much younger than 14, though some may be brought younger by their fathers.

A number of boys, about 40 or 50, work in the cutting shop, flatting the goods. They are not apprentices, and are so irregular and uncertain that we are obliged to keep a far larger number than we should if we could only depend upon them.

A number of young women, about 40 in all, none of them under the age of 18, work at washing and cleaning the glass, and others in the warehouse. Men pack.

The hours in all the departments, except the glass-houses, are from 6 a.m. till 6 p.m., with full meal times, and are never exceeded. If more work is needed, we simply take on more hands, which we can easily do, as our premises are very roomy.

154. *Thomas M'Graby*, age 13, taker-in.—Work in turns of 8 hours on and 8 off. Begin on Mondays at 5 a.m. one week, and 1 p.m. the next. Finish work Saturday morning or Friday night. Work stops for 16 hours on Wednesday. Stop in the middle of a turn to eat, and start again, just as soon as you get it like. If ever there's a lad bad, and can't come, I work for him too, and get his pay. Get 7*s.* or 8*s.* a week usually. Don't ever work more than three turns running; it's ower lang, that is. Am very tired when working three turns. Can't get any sleep in the 24 hours of working. Sometimes am three or four weeks without working over. There are a vast littler than me here, some about 11. I have been here two years.

Put on a comforter; it's hot work. When I've got a cold it hurts me in the chest.

Worked at another pressed flint-glass place (Gray's) before, and worked there in the same way, 8 hours on and 8 off.

Canna read or write very well; was na very lang at school. Go to chapel and school on Sundays.

[Can read a little.]

155. *James Shannon*, age 14 (?).—Don't know how old I am; yes, warrant I'm 14. Am a flatter. There are 40 or 50 boys flatters. Work from 6 a.m. till 6 p.m., or till 5 or 4, but never make any overtime.

Was at school, but didn't learn much. Don't know how many weeks there are in a year, or if London is a big town; I warrant it's a large place.

THE NORTHUMBERLAND CO.'S FLINT GLASS WORKS, FORTH BANK, NEWCASTLE-ON-TYNE.

156. *Mr. Dodd*, partner.—This is the oldest blown flint-glass establishment here, and there is none in this part of the country on a larger scale, *i.e.*, with more than one furnace. The manufacture of blown flint-glass has fallen off, and that of pressed flint glass increased so much in this district.

We have the usual blown flint-glass system of work by relays of 6 hours each, going on day and night continuously from 7 a.m. on Monday till Thursday or Friday. Our glass-cutters work daily from 6 a.m. till 6 p.m. In France and Belgium, two of the principal flint-glass countries besides England, the glass-makers work, I believe, 12 hours at a time, in day and night relays. In Bohemia, where I have been, glass is

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* One firm, at least, at Birmingham does. See No. 96.—J.E.W.

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made in small places by day only; but this is possible only from pots being small. The work is good, but this is because labour is so cheap.

There are several reasons why glass making must go on day and night continuously. When the metal is ready it must be all worked out of the pots without stopping. But most of the articles made are so small, and the amount of labour so great in proportion to the quantity of metal used for each, that this cannot be done in a shorter period, as in crown, sheet, or bottle glass houses. If, in order to allow of working all the metal out in the day, only pots small in proportion were used, the metal could not be got properly fine in them. Besides, there is economy in space and arrangement of furnaces and work in having the large pots and furnaces. Also, to suit smaller pots, the present furnaces would have to be knocked down, and new ones put up. Again, if the metal were prepared in several small batches, instead of in one large one, the shade of colour might vary; and this not only where coloured glass is used, as green, amber or blue, but even in the simple white glass of which the great bulk of things are made. Of course, a whole set of several articles, wine glasses for instance, must be of just the same shade. The same kind of materials may be used in just the same proportion, and yet there may be a difference in the result, either from the raw materials varying in quality, or from some difference in the heating of the furnace, depending sometimes even on the state of the wind.

The size of the pots and furnaces in common use has no doubt come to be fixed at that which has been found to make the best work and be the most profitable. Our pots hold about 13 cwt. of metal each. In some houses I believe that they are larger.

All the metal in the pots must be worked out if possible, for whatever quantity is left in, that amount of work would be lost. Sometimes, however, a quantity is left in unworked, and fresh metal is melted up with it; but it is better to lade out the metal which is left, and put it into water; but either way, whatever is left is used up again. It is rather more apt to be brittle from having been in the water.

Even supposing that the furnaces and pots could be arranged for day work only, there would be a waste from the lear, in which glass is being cooled, burning for nothing.

The greatest difficulty which we have with the men, and consequently with the boys, is occasioned by the glass makers' unions, which dictate the wages and the quantity of work which men should make; and over and above their high wages, the allowance which they demand for trifling work, such as removing or setting pots, sweeping the "crown" of furnace, &c. If the allowance be refused, they all stop work, and consequently the works are laid in, and the boys have to be supported by their employers.

This is not all, as the giving of drink money to the men, who as a body are very unsteady, causes so bad an example to the boys, socially and morally, that they grow up with the same tastes and follow in the same footsteps as the men.

[A taker-in, aged 14, had been 5 years in a glasshouse. Worked "over" sometimes. Could read very little.]

MESSRS. W. AND R. FERRY'S, FLINT AND GREEN BOTTLE GLASS MANUFACTURERS, HILL GATE, NEWCASTLE-ON-TYNE.

157. *Mr. W. Ferry.*—We work in the way usual in blown-flint glass houses, viz., in relays of 6 hours each, though ours is quite a small house, with only two chairs. If boys could not work at night we should have to work in the day only. This could be done, and I have thought of doing it, and should do it if my sons objected to the night work. It would require only a trifling alteration. We could live so, and live well, and every manufacturer could. The only thing would be, that he could not turn out so much work, and would not make so much money. The furnaces could be kept up well enough. It is true that the cost of this would be greater where the furnaces are large. I certainly have a very great objection to night work; people who are engaged in it miss so many opportunities of improving and refining their minds. Music softens the mind very much. I regret greatly that two of my sons, by being in the glass house, have been cut off from this; though two of their brothers, otherwise brought up, are good musicians. I am very fond of it.

We seldom take boys at all under 13 or 14 years of age, even as takers-in. We don't like them; they are of no use to us. A little boy is worth nothing at all. By that age they begin to think more. It requires knack. If a boy has a mechanical turn, though he may not know a bit of a book, that's the boy for us. If a boy comes younger he is careless, and merely does the work because he is so used to it; but he does not think, and does not improve. A boy beginning at about 13 or 14 will make a better worker than one beginning at any other age, either younger or older, but of course he must be fairly set down under a good man, and well taught. But it often happens that a man will not take pains to bring on a boy properly, as he sees that then the boy may perhaps step into his place.

This jealousy of keeping out boys has been very injurious to the trade. The men, by their union and allowing so few apprentices, have now so thinned down the trade that they can demand very high wages, and are tempted to spend too much in drink. The masters, too, sometimes cannot get men. The result of this scarcity of blowers, and their independence and irregularity, has been to drive the ingenuity of the press men to make a vast of kinds of glass by the press that would otherwise have continued to be made by the blown-glass hands.

Beginning glass-house work under about the age which I have named is also very bad for the boys. It is dreadful to think of the poor children in some cases. In the black bottle houses it is worse than in the flint houses, as the hours are longer, viz., often from 11 to 13 or 14 hours at a time. The pots are now larger than they were. Only 63 dozen used to be made in a journey, but now sometimes 120 dozen are made. I know a house in Scotland where they are now making double journeys every day, and six days in the week. It must be hard work that. From what I have seen of the work in bottle houses and other places, the American blacks in the south are not so bad as many in this country.

But in a flint house too, if it is large, the work is very hard for a young boy. In one of good fair size, say with an eight-pot furnace, a boy may have to run 30 or 40 yards each time that he takes a thing to be annealed, and as soon as he comes back another is ready, so that in fact he has never done running. They have very little time to whistle and sing then. In a flint house that I worked in a boy had to run each time 40 yards going and coming. Sometimes it is more. With some kinds of small easy work 150 pieces will be made on the average in an hour if the men work close, so that in the six hours the boy will have to take in 800 or 900 pieces. This will come to a good many miles. (40 yards × 800 = 32,000 yards = over 18 miles, J. E. W.) In this town too I have seen them run without shoes or stockings, but their feet get that horned that they do not mind. I knew one who for a halfpenny would put his bare feet on pieces of hot glass that had been cut off, and stamp them out flat.

I have oft observed, and I have been nearly 50 years in the business, that those glass makers who have begun over young are weak and sickly. Young boys must have sleep, and cannot get it properly when they have to work at night. But it is only very few of those who work in glass houses as young boys, who rise in the business. It is only the cleverer

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and stronger. The others fall out and go to other work.

It is a most deplorable thing, but most glass makers are very ignorant. Of those that I have been amongst not 1 in 10, I should say, could write their own names. Amongst the bottle glass makers it is worse. Owing to the night work there is greater difficulty in boys getting any schooling at glass-house work than at any other. In a large flint glass firm for which I worked, I suggested to the master to have a school in the spare time at the end of the week, and he was delighted to support it. But the boys said that they were tired, and they had got into such low glass-house ways, so they would not come. I value a good education and give it to my children. I always say that I would sooner have educated men to work for me. Some think otherwise. A friend of mine, a large glass manufacturer, says that giving education is like training a man to use a two-edged sword, and not thinking that he will use it to strike some one. But I find that educated men have finer and brighter ideas about business, and are better to govern. You can persuade and convince them. If they are not educated, they always fancy from the prices at which things are sold that the master must be making a vast lot of money, never taking into account his expenses and risks, and it is of no use to try to convince them of the real facts.

The most depravity too is found amongst the uneducated. I have been struck with this in the prison returns, which give the number of those who cannot read or read imperfectly. In fact education is desirable, not only for pleasure and for the good government of the country, but it refines the taste and makes better citizens in every way.

MR. D. MARTIN'S, FLINT GLASS MANUFACTURER, NEW CHATHAM, GATESHEAD.

158. *Mr. D. Martin.*—I am the only blown flint-glass manufacturer I believe who works by turns of eight hours on and off, instead of by turns of six hours, as is usual throughout England in blown flint houses, except in very small places or cribs, in which they work 12 hours on and off. "Cribs" was the name given to such small places when smuggling was going on. The plan of working only six hours at a time came from this. In summer time a man gets very faint, as any man would tell you, working as he does in a temperature of from 80° to 100° and the sweat running off his face. In summer time 100° was the average temperature in a great number of flint glass houses, *i.e.*, in the parts where the man works. Now they try to ventilate houses more, and where this is done men could work longer at a time. By good ventilation you can get the temperature in which the man works down to, say, 75° in summer.

I wrought for a year in a large pressed flint-glass manufactory here after they changed to the eight hours plan. They did it some years ago because they thought that three changes in the 24 hours would do as well as four. I found it suit me much better, so when I started for myself I said to my men that we would try it, and if it did not answer we would change back. It does answer much the best, and the men like it decidedly best. We begin at 5 a.m. on Monday, and the turns change in alternate weeks. Thus we always get two nights in the five working days, and get a day of rest, a sabbath, and the Sunday besides. Night is the time of nature for sleep, and a man can do a deal more work and do it better working in the day. I believe that it is mere prejudice which makes people keep to the six hours plan. I was quite against the change to the eight hours turn, and refused to agree to the change. Having been so long at work in one way, one would sooner keep to it, and I had worked on the six hour plan for 40 years. It was only when we had begun it and found that it was better, and that we got more rest, that we came to like it. Putting your clothes on and off, &c. only three instead of four times is a great saving of time. We calculate that there is a loss of half an hour by each stoppage, and with six hour turns that comes to five hours a week. The boys too on my plan can get a little out in the air in the summer time.

In all the pressed flint glass houses that I know in this neighbourhood, and I know most of the works, they work by eight hour turns.

The amount of work turned out has increased several fold by the use of the press. I can calculate, knowing pretty well the number of tons turned out in a week by blown flint and by pressed flint houses. The pressed or machine-made glass is so much cheaper than the blown that a man, *i.e.*, one who makes by blowing, could not stand against the machine at all were it not that the blown glass is so much better and stronger, *e.g.*, ten pressed flint tumblers would crack in use for one blown tumbler. Some glass made in moulds is blown by an air pump, the breath not being strong enough. Much is moulded by pressure only.

Glass makers are in general healthy. I believe the reason is that if they catch a slight cold they sweat it off. The effect, if not the cause, of cold is the stoppage of perspiration. But it does not do to have the place too hot, and there should be as much ventilation as possible. I have put shafts which run up from the front of the furnace to the outer air, and I believe that there is no glass house in the kingdom better in this respect. It makes the furnace burn better and keeps the place cool. This is a great saving. If a man is working in a temperature of from 95° to 100° he is done very soon; if it is only 75° he can work eight hours. Flint glass making is not heavy work, it is the heat which exhausts. I have often tried the heat. Perhaps about 80° is the average, *i.e.*, taking it at the mean distance between my seat and the hole, which is the fair way of trying it, as you are part of the time at each. I have worked in a temperature, so tested, of above 100°. In that temperature you are very warm, but cannot sweat at that heat; the perspiration stops, and when that stops you begin to suffer. When you come to work any time at about 100° you feel quite short of breath and uneasy, with a sensation of heat, and tremendous thirst. It is sometimes up to 120°, and then the bees-wax, which you must use, begins to melt, and when that is off it is time for a man to be off.

In winter, however, it is sometimes very cold. I have been where in part of the house the thermometer was at 20° and water froze. Here sometimes in winter we work in two or three flannels. Flannel makes you a deal more comfortable, and if you get wet with sweat you don't feel it, but are warm and dry. We stop the openings up to keep the cold out, but do what you will there will be cold places in a glass house in cold weather.

A spare boy to a chair is a great advantage, though he is not constantly employed. A chair, say, paying a boy 5*s.* will gain 10*s.* by his work. The spare boys are paid by the men, the others by me. I have a small engine of 3½ or 4-horse power for cutting the glass. I have three chairs, and employ six boys.

MESSRS. M'DERMOTT, CONOLLY, AND CO.'S, FLINT GLASS MANUFACTURERS, PIPEWELL GATE, GATESHEAD.

159. *Mr. Thomas M'Dermot.*—If I had my way I should say that 14 was quite young enough for boys to come into a glass house. I consider that under that age boys are not firm and strong enough or their constitution either for such work. It is cruel to have young boys at it. Coming at 14 they could carry on their work better. Indeed I consider that in many other trades too the case is the same. Beginning as

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late as 14 would not prevent them from turning out good mechanics. I have known many very clever mechanics who did not begin till they were 16. Probably, however, glass cutters and some other trades would not allow boys to enter older than 14. Boys are not suitable for night work; only grown people should be engaged in it, as their constitution is strong. The glass makers would be very fair men for health if they did not injure it with drink.

There is no reason why flint glass makers should not work 12 hours at a time as men do in any other trade instead of 6. It would make no difference to us. I have often told them that they work 6 hours only because they want to make the work seem harder than it is.

Ours are small works. In the cutting shop there are four boys, the youngest 11 and one 12. They work from 6 a.m. till 6 p.m. with full meal times. There are also two young women who rough glass there. Sometimes in the cutting shop we make overtime till the whistle at the railway engineering shops near, *i.e.*, about 8.30 p.m.

160. *Edward Chilton*, age 11.—Came as taker in when I was 9. Begin work at 1 p.m. on Monday and give over Friday night, sometimes Saturday morning, six hours on and off. Never took a turn over; some do when the other lads are badly. Get 5*s.*, 4*s.*, and 3*s.* 6*d.* a week.

Never was at week-day school. Cannot tell the letters.

R. Gray's, Flint Glass Manufacturer, Pipewell Gate, Gateshead.

161. *R. Gray.*—I make flint-glass and green-glass bottles. Usually we only work by day. If there is full work we work day and night by six hour shifts; or sometimes we work only by day, but begin earlier as at 3 a.m.; but the boys do not come then till 6. Two boys blow and there are five men. A girl comes to the glass house two or three days a week to pick the waste. Men could do without boys at night, that's all about it.

162. *Joseph Conmore*, age 12.—Taker in. Came at 6 this morning, will leave at 7 this evening.

Don't know the letters, Wasn't at school above a month. The master died and the fresh place was 4*d.* a week; the other was only 2*d.* That is why I left.

[I visited also some larger flint-glass works (Price's), and found them conducted in the usual way.]

Yorkshire.

Mr. S. Blunn's, Flint and Bottle Glass Manufacturer, Kilnhurst.

163. *Mr. S. Blunn.*—I have a flint glass house and a bottle house here, and another flint glass house for light work near Rotherham. In the bottle house we make five journeys a week, and reckon that in each the work leaves off in about 13 hours from the time that the hands are first called. My bottle furnace has four pots, but two of the holes are double, so that there are six holes or sets of hands. Castleford in Yorkshire is the metropolis of the pale bottle manufacture. Four pot furnaces and five journeys a week are the usual system there, just the same as with me.

In my flint houses the hands work by turns of six hours only on and off, from 7 a.m. Monday till Friday evening or Saturday morning. There is no real reason why they should work only six hours at a time. It would be much better if they worked 12; they could easily do it. The work is not nearly so laborious or severe as in a common bottle house.

In one house a boy over 18 years old is still working as a taker in at 5*s.* a week because he cannot be put on as apprentice yet. Boys come to us first from about 12 years old. The work is lighter and easier for the boys too in a flint than in a bottle house, and less boys can do it.

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164. I visited the only flint-glass manufactory now in operation in Sheffield. It is on quite a small scale, but worked upon the usual system. There are, I was informed, a few other places in that town in which glass-cutters work, some cutting optical glass for lenses, &c. The York Glass Company at York carry on both flint and bottle works, the former on the usual system, the latter in the way described in No. 163 as common in Yorkshire. In Bristol a few glass-cutters hire steam-power from a factory of another kind, which I visited there, and cut glass brought from the Birmingham district.

Glasgow.

Messrs. James Couper and Son's, Flint Glass Manufacturers, Glasgow.

165. *Mr. James Couper, junr.*—Our hours and system of work in the glass house and cutting shop are the same as are usual in flint glass manufactories generally. We do not care to employ boys under 13 years of age, and it might be well that they should not work in a glass house younger; but I do not see how it is possible to restrict boys over that age from night work. Men could not be put to do the boys' work. Boys must take in before they can be put on as apprentices to foot-making, and they must learn this while they are still boys. Of course, men in their full strength could not be put to such work as taking in, and elder men would not be active enough. The work is light but requires great quickness and activity, and a man of any age could not do it properly, and would be much more in the way than a boy. Our manufacture is so peculiar and is already subject to so many difficulties and restrictions that we should be spared any more.

I should say that we never put on a boy to foot-making under the age of 14, and sometimes they are as much as 16, but I do not know if any have been older. There are so few opportunities of filling up vacancies with boys, that we seldom have a chance of putting on boys young. A boy who is in the glass house now, and will be put on as soon as there is a chance, as he is suitable for the work, is 17.

The system of apprenticeship is different in Scotland from what it is in England. Here there is no age at which the law frees an apprentice, but at whatever age he is bound, he must fulfil his full term of years though he be above 21. In our works 7 years is the usual term, but I believe that is not so in all Scotch works.

In the cutting shop in which we have a great number of boys, we have for some years made it a rule not to take any boy unless he can read and write. These are the signatures of some to their indentures (*shows*). We wish to make the same rule in the glass house, but we could not make such an absolute restriction there, because a boy who is well trained and suited to that work cannot be parted with. For the cutting shop others can be found without much difficulty. Still we tell all the glass house boys that they must learn to read and write to qualify them to be put on, and if they cannot, exact a promise that they shall attend night schools. We also try to get the boys to attend the school of design, and paid half the fees for six, but out of these only one would attend. We are very anxious to have all the boys educated, and are perfectly satisfied that they would make better tradesmen for being so.

There is one point to which it is important that public attention should be more directed than it is, and that is the amount of time given to night schools. After a full day's work boys get tired and are not fit

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to go to school for a couple of hours. When they get there they are drowsy and fall asleep for a good part of their time. If they only went for an hour, and had an hour before to refresh themselves and get a little sleep if they wanted it, I am satisfied that they would attend and learn more in the hour than they can now in double. Besides if a teacher had only half the number of boys at once, say 15 instead of 30, and for a shorter time, he would be able to teach each set with greater freshness, and keep a closer watch on each.

166. *Edward O'Connor*, workman.—My son, now 17, who works here as foot-maker, went last year and goes now to the school of design. The first turn in which he is finishes at 1 p.m., and he is thus in time to go to the school for two hours on three days, on Monday, Tuesday, and Wednesday. I have arranged this for him because I have known in my own case how important a proper education is. I was as big as I am now before I was taught, and I only picked it up myself because I took a fancy to it, but it is not all who will do that.

The age at which the youngest boys here are put on as foot-makers is usually about 15. In Scotland if a boy is bound very young as at 12 or 13 his apprenticeship ends in the stated number of years, though he is not of age.

Edinburgh.

167. The system of work and hours in the three Edinburgh flint glass manufactories, all of which I visited, is the same as that usual in England. At the first (Ford's), four boys, whom I questioned in succession, exclusive of the boy, No. 169, could read. At another, of five that I questioned, four said that they could read and write; the fifth could read a little. At the third, the only boy that I questioned, one 12 years old, and getting, as he stated, 6*s.* or 7*s.* a week, did not know A or B, though he knew O. He had been a taker-in three years.

Mr. J. Ford's, Flint Glass Works, South Back of Canongate, Edinburgh.

168. *Mr. J. Ford.*—The six-hour turns have been the system in flint glass houses for generations, and prevail wherever English workmen are employed. I believe that the system on the continent, or in some parts of it, is different, the work there being done chiefly in the day. But the pots used there are smaller than those in this country. The fuel too may make a difference. Wood is used there. A glass house is built, say, in a forest, and when the fuel near is used up it is removed to another place. We use coal, which gives off much sulphur, and this, unless guarded against, would destroy the purity of the glass. For this reason we have to use covered pots. We begin Monday morning and finish on Friday. If the metal is not ready at the proper time for beginning on Monday, the workmen say that the firemen have been neglecting their duty, *i.e.* if they speak their mind at all. The glass making is more healthy than the cutting, or would be if the men did not exceed, *i.e.* in drink. We lately had a man over 70 years of age, blowing. I very rarely take a boy under 11 years old. They generally become foot makers at about 15. Overtime is very rare in the cutting shop. Sometimes there may be an hour. One or two of our men took an interest in having a school at the end of the week for the boys, but it is given up now. Some mode of enforcing or securing an education for the boys would be a great benefit to them.

169. *John Bullock*, age 14.—Have worked over two turns in a week, never three. Can read (imperfectly). Was at school six years, but not all the time, and did'nt keep up very regular when I did go. Used to go to Sabbath school but gave it up because I had no good clothes to go in. My wages are 4*s.*, and with the over-work I get 6*s.*, 5*s.* 6*d.*, and the like of that. Have a father; there are only three of us at home.

> [Four boys coming in to begin their turn as I left, *i.e.* just before 7 p.m., said that they had all been to bed that afternoon.]

170. *David Anderson*, adult.—Gaffer or workman. We have been making an endeavour to get the boys to attend school, and to take some of their expense. Some of us took up a school on Saturday from 11 till 1 in the morning, and from 4 to 7 in the evening, and kept it on for five or six years, but for the last two or three it has dropped through. This plan could, I think, be carried out very well here and in other glass works. But I think that the employers and men between them should force the boys to attend. It would be better if all were taught, and would be a great benefit to all belonging to the trade. Boys go to the work too young; I went at 10 years old. Some who could do nothing when they came to our school, got to read a little bit for themselves from it. Out of the lot of boys here, about 18 altogether, I believe that very few can read, or if they can do that, can write. Two or three, I believe not more, go to Sabbath school.

Dublin.

Messrs. Pugh, Munkettrick, and Co.'s, Flint Glass Manufacturers, Potters' Alley, Dublin.

171. *Mr. Richard Pugh.*—Our work is of the same kind, and carried on in the same way as in flint glass manufactories in England. It begins rather later, viz., at 8 a.m. on Monday, and in a proper week ends at 8 a.m. on Friday. Sometimes only 3½ turns are made, sometimes 4½ or five. We sometimes work an "overtaker," *i.e.* fill more metal into the pot in the course of the working week. If the metal is not ready at 8, work is put off for a turn or two; the hours of the turns are never altered. The hands in the first turn stop about a quarter of an hour for breakfast at 9. I do not see why they should not take it before they come, but the men say that they cannot eat directly they get up. The other turn stops at 3 p.m. in the same way for dinner, and for tea or "baggin" at 5. Five persons work in each chair, viz., a workman or gaffer, servitor, foot maker, full boy, and taker in; but one chair has only four. Most of the takers in are from 9 or 10 to 13 or 14 years of age, and the full boys usually older. The full boy does different work, according to what is being made. For goblets he gathers the stem and foot; for wine glass he gathers the stem and blows the foot; he sticks up tumblers, and so on.

The work of the takers in is very simple. Just at first they are rather awkward, but in a fortnight, if they are sharp lads, they can do it well; if they are not sharp they would take longer. When we have occasion for extra boys, as when we make pressed work, or some are away, we take on odd boys, of whom there are a great many always hanging about looking for work; they can do it quite well enough. A boy quite fresh to it could do it when just shown once or so. Or we take a boy from the other turn to work over. Perhaps two chairs do pressed work once a week. If a man is sick or from any cause absent from his chair, a man from another chair works over in the same way, or the chair works short-handed. A taker in gets 3*s.* for his stated week of 11 moves, and 1*s.* or so for the overwork.

Work in the cutting shop is from 6 a.m. till 6 p.m., and till 2 p.m. on Saturday. The engine stops from 9 to 9.30 a.m. for breakfast, and from 2 to 3 p.m. for dinner. Sometimes a quarter of a day over is made,

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i.e. till 8 p.m.; perhaps one night a week for three months in the year. But the men do not tolerate working over much, as it makes a monopoly for those who are in employment. Only one or two of the cutters are boys. The glass cutters' Trade Society's rules only allow one boy to four men. A few boys obscure lamp glasses; these also work with the engine.

There are a few cribs in Dublin, four I believe, employing on the average, say, four men and two lads each. Cribs sometimes work by eight hour turns. They say that they should not make enough work if they changed so often as every six hours. With the exception of another small flint glass manufactory, smaller than ours, and about four cribs, and the two bottle works in Dublin, and a crib in Belfast, there is now no other glass of any kind made in Ireland. There were several glass works and a crown house in Belfast, but all are now given up.

172. *James Rowe*, age 12.—Full boy. Begin work at 8 a.m. on Monday, and work till 2 p.m., and go on so usually till Friday or Saturday. Go to bed in the afternoon and get up at about 7 p.m. Usually get here about 20 minutes before work begins. Worked the same hours at the other flint glass place in Dublin. Worked over there pretty often; whenever a chap did'nt come. Worked over here one turn last week and one the week before, only when a chap was wanted. Never work more than 18 hours at a time. Get 7*s.* a week, some weeks 8*s.*

Never did have a very good colour (*coughs*). Think I caught cold in a steamer. The cough only hurt me once, here (chest). Sweat a little at work. My eye is black from a burn. Another chap had got the iron in his hand and it hit me on the eye. The men do hit me sometimes if I am awkward, but it's for my own good. They would not go to hit any one with the iron. Cannot read, but can tell the letters. Was not kept very long to school; only two months.

> [Another full boy was 17, but earned about the same wages. He could read but not write.]

173. *John Murphy*, age 9 years 9 months.—Taker in; here five months. Work with last boy (No. 172) and the same times. Am the youngest here. Get 3*s.* a week; never more, no matter how long I work.

Don't know all the letters (spells a little). Was only two months at school.

174. *Daniel Murphy*, age 19.—Glass-cutter. Was apprenticed at 12. Sometimes putty four hours a day three days in a week; perhaps 12 hours in the week is about the average time for which I am puttying.

> [The glass-cutters here showed the same impression as to the injurious effects of this work as I have found elsewhere. "It is "the unhealthiest part of the trade. It "affects the hands of some in England." Another smaller place works eight hour turns.]

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175. —— *Sheridan*, flint glass blower, Abbey Street, Dublin.—There are, I believe, four small glass making places like mine in Dublin. I melt up old material, such as broken bottles, and make small vials. When I have full work I employ three men and two boys. Two of the other places have now only two men and a boy at each. We work in turns of eight hours each, and make seven or eight turns each in a full week. We generally begin about midnight on Monday or 1 or 2 a.m. on Tuesday. From Tuesday morning till Saturday is as long as any small place works. But very often there is not full work; sometimes there is none. There may be no orders, a pot may break, or the furnace not heat, or the hands may be short; so work is often irregular. We sometimes work on then as long as we can, 12 or 14 or 16 hours perhaps, to make up; but man and boy could not continue that; we only do it in case of necessity, and could not work so much in summer time. We stop once in the eight hours to eat, or perhaps twice if the furnace does not go well. If pots break we are done for the week. In large works they keep pots in the pot arch ready to be put in at once in place of any that break.

Belfast.

176. *Mr. M'Cormack*, Belfast.—The flint glass manufacture has almost entirely left Belfast for about eight years now. I carried it on till lately, but have had to give it up, for the present at least. The work was carried on in just the same way as it is in England. There is a crib where old glass is used up for small whiskey bottles, &c. In this a few men and a boy of, say 13, work a day of 12 hours, not by night. I was 14 when I began work in a large house, a boy is no use younger.

Surgical glass making is a job done by a man at home, with a blow pipe, very injurious work.

Watch glasses are made by cutting out round pieces from large balls, say 15 inches in diameter. They used to be cut out with a hot poker, but this is now done by a machine. We used to blow these balls. Women grind the edges of the pieces on lathes worked by the foot. But very few are employed at it here.

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MR. J. CANDLISH'S, GLASS BOTTLE MANUFACTURER, SUNDERLAND.

177. *Mr. James Makepeace*, manager of the glass houses.—In each of these houses there are four holes and five persons working at each, viz., the bottle-maker, the blower, the gatherer, the putter-up, and the taker-in. The two latter are always boys. Sometimes there is a spare boy also. The youngest that come are about 10 years old. If I had my choice, I would never take a boy under the age of 13 or 14, but I take younger boys, as men wish to bring them, and it is worth while to have them if it enables me to oblige steady men and keep them. A boy of 13 or 14 learns quicker than a younger boy. If he is a fairly quick boy, he will become handy at taking-in in a week, and a month is quite sufficient for him to learn to put up. But no definite time can be named within which a boy will become fit to gather. This depends entirely on his brains and skill. We had one lately who was able to gather well at once after having been a putter-up only five or six months. Another might be as many years a putter-up and yet not able to gather. We had two apprentices that could not learn gathering at all, and we were obliged to let them go in consequence.

Boys are usually put as apprentices to gathering at from 14 to 16 years of age. A boy must be a taker-in before he is a putter-up. The latter has to work so close amongst the men that he would get his brains knocked out if he did not know how to keep out of the way. In fact the men would not be bothered with one who did not. One of the packers has to start a boy at first and show him how to do his work.

There are six journeys in a week when there is work enough to do. The journey or period in which the metal is worked, is called the "in work" journey, and is on the average from 11 to 12 hours. The first begins on Monday morning at about 1 o'clock, and the others as near the same hour on following days as we can get them. But as the week goes on they are apt to begin rather later. This is owing to accidents, or neglect, but if we could we should always begin at 1 a.m. We can always do so on Monday, because Sunday gives plenty of time to get the metal ready. On other days, as soon as ever it is ready, then the men are called. Preparing the metal which is called the "out work" journey, also takes on the average 11 or 12 hours, if things go well. But sometimes pots break, or the fires are not properly attended to, or other things happen, which cause a delay of two, three, four, or more hours, in beginning the in-work journey. Thus, this week, in one of the houses the in-work journey began on Monday at 1 a.m., on Tuesday at 2, on Wednesday owing to the breaking of pots, not till 9 or 10, on Thursday at 11, on Friday at 12 noon. The bottlemakers will not in any case work after 4 p.m. on Saturday, however much metal may be left in the pots.

Taking a long period of time, the out work journey is more often under 12 hours than not. If we keep clear of accident and neglect, 11 or 12 hours will do for it. I have known it take as much as 16 or as little as 10 even, when only the usual quantity of metal had been left in from the previous journey. Some is always left in. From four to six inches of metal in depth left in is enough to make a good bottom for the next founding. Sometimes 8 or 9 inches are left, and that makes the next out-work journey shorter.

The size of the pots and the length of the journeys are arranged so as to allow of making a complete journey, as nearly as possible, in each period of 24 hours, or six in the week if necessary. The reason for beginning at 1 a.m., or soon after as possible, is to allow a margin for accidents and delays. If work did not begin till 6 a.m., and any delays occurred, it might be impossible to make a full week. The men are entitled to be paid for the stated week of five journeys whether as much is made or not. A journey made on Saturday is reckoned as overtime. It is therefore necessary to arrange so as to allow for completing the fifth journey on Friday, and we now do finish it on Friday night. I hear old glass-makers speak of not finishing it till 10 on Saturday night. The time has been gained in different ways. Less time is now taken in the preparation of the metal. The bottlemakers have better implements. The shears (tools for shaping the neck of the bottle) are better. The open and shut moulds now in use enable them to make probably a dozen in an hour more than they could with the old open mould, with which the shoulder has to be formed by blowing. They can make now from nine to 10 dozen in an hour. Formerly they made only seven or eight dozen in the same time. From these changes, by what I hear, there is a difference of 48 hours in the five journeys.

The number required to be made by each hole in a journey is 63 dozen, but usually they make 90. Sometimes we make over 100 dozen, and we have made as many as 136 dozen in a journey when making pints. When we came here the pots would give 90 dozen in a journey, but the larger pots which we now use will give 100 dozen. If the pots were larger it would take a longer time to fill and found and also to work them out, and if they were smaller, a shorter time; and the length of both the in-work and out-work journeys would be increased or diminished accordingly.

The in-work journey may be lengthened by delays happening after it has begun, as well as delayed in its beginning by things happening before. But it is very rarely indeed that it is ever lengthened to as much as 14 hours. For instance there may be a "call back." This is when the in-work hands have been called, and when they come, find the metal not fit to work. If it is very bad the out-work hands are called back to make it fit, and hence a delay may arise of perhaps four hours. If there is a very high wind, and we are not careful and keep all the doors closed, it may make too great a heat, and the bottlemakers might have to stop work an hour or two, and sometimes to leave off altogether.

In all this part of the country the rule is to work six journeys or as near as they can get to it. The length of time taken for founding, depends upon the arrangement of a house, management, and partly also upon the situation of a house as to draught of wind, &c.

The practice in this part of the country is to have women and girls to draw the arches the same as here. In each house here there is a woman called a "tallier," and a "drawer" or girl who gets into the arch and hands out the bottles to her. As soon as they have done this, which they can do in from two to four hours, they go home. A woman and girl get 9*s.* 6*d.* a week for the four journeys, or 11*s.* 5*d.* for the six. A few hands are employed in the warehouse sorting, &c.

The men would not have any difference made in the way of carrying on the work as to hours, &c. It might be made, otherwise. The men's society is broken up, but they stand together just the same. If anything contrary to custom was wanted of them, they would say that it was not their "rights."

178. *Margaret Corn*, age 12, drawer.—Go into the arch (annealing kiln) and hand the bottles out to the young woman who fills the grates (crates) with them. It is very warm in the arch, and the heat is very bad for me; I had to be off one day this week for it. The sulphur came through from another kiln which was being heated, and it made my head that bad I couldn't stand it. A hole in the wall wanted mending, and I had to take dabby (clay?) and stop it. It is very disagreeable in summer time. I have the headache very bad then, and sometimes cannot stop at work for it, but generally feel my head bad most not in the arch but directly I come out and get home. Feel my head most on Mondays when I come fresh after Sunday. Sometimes it is too hot for me to go in and I have to wait. The kiln is usually very hot on Saturday. Am poorly with my head and sore throat, nothing else. My throat has been sore and had lumps in it for three years. Have been at this work four years. Haven't a good appetite. Went to the doctor once; he said it was all from the heat and the hard work in the kiln that I was bad and had the lumps in my throat, and that it would be best for me to stop at work in winter and leave when summer came, which I did. He said if I didn't take my meat I couldn't do my work.

The drawing only takes about four hours, and I come out several times to bring back the empty grates. Get 4*s.* 3*d.* a week. Know it is four years ago that I came here as drawer, because father died four years since, and I came to work then because of it.

> [The girl who was called from the kiln in the glass house to speak to me outside shivered so miserably, the day being raw and windy, that I could not bear to keep her longer.]

179. *James Hart*, age 12.—Taker in. We are called (*i.e.*, to come to work) on Sunday nights at half-past 11 and 12 and so, and other nights later, *e.g.*, 2 and 3, &c. a.m. One Sunday night we were called at 9, because the metal was fine so soon; the men began working at about 11 that night. Have been called a few other times before 11 on Sunday night. From the time I am called till the time I leave work it is generally 13 or 14 hours. The men are at work about 12, but we have to come about half an hour or an hour, sometimes two hours before them to get things ready and call the men, and stay a quarter or half an hour after they are gone, to sweep up coals, &c.

Cannot read. Was never at school at all. Went to a chapel once. Was never in my life in a church or chapel but then. Don't know what the Bible is. Heaven is up there (*pointing*). The best of folks go there, them as is kind.

[Is hoarse. Face grimed with coal-dust].

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THE AYRE'S QUAY GLASS BOTTLE CO.'S WORKS, SUNDERLAND.

180. *Mr. John Scott*, managing partner.—We manufacture black bottles. We have two separate places of work in the town, one consisting of four glass houses the other of two. Each house or furnace has four holes, and five persons work at each hole, viz., the finisher, blower, gatherer, putter up, and taker in. Boys come as takers in at about 11 years old; occasionally there is one as young as 9, but the youngest work as spare boys, go errands, &c. Boys do not continne putters up beyond the age of 16, often not so long. They are apprenticed to gathering sometimes at the age of 14 or 15.

We make six journeys a week when there is full work, or if there is not, five. The amount of work required to be made in a journey is 63 dozen bottles at each hole. All that is made beyond this quantity is overtime. Some time ago I took an average of the work made at all the holes, and found it about 90 dozen in each journey. One hole turns out about 10 dozen in an hour, and an hour or two is taken up at starting, and stopping for a meal, &c., so that an average journey takes about 11 hours. Sometimes a higher number, as from 100 to 110 dozen is made, and this will lengthen the journey perhaps an hour or two. One week, one hole I see made 609 dozen, but that is a very full week.

The first journey begins at 1 a.m. on Monday and gradually later by about an hour each day, as the week goes on. The preparation of the metal takes about 13 hours each time. If part of the metal is left over, unworked, from the preceding journey, it leaves a less amount to be fresh melted, and thus the time required for preparing the pots for the succeeding journey is shortened, sometimes to as little as 8 or 9 hours, according to the quantity left over.

We must begin at 1 o'clock, or as early as we can in the morning, to leave a margin for delays by accidents, &c. The men must be paid for five journeys in any case, and therefore must work five at least. We are generally able to make six journeys in the week if we wish it, but I believe that this is not the case in all houses, *e.g.*, if the coals used are not good, the metal will take longer to melt, and the work thus be delayed.

The workmen please themselves as to how long they stop for their meals. If a stoppage of a fixed amount of time for a meal were required, it would not hurt if the week's work were well forward. It would not injure the work itself, but merely be the loss of so much time, which might prevent us from getting a full week's work, especially if any accidents were to occur, such as broken pots, &c.

Very great difficulty would be caused if boys were not allowed to work at night, or if young boys under a certain age were not allowed to work here at all. If two sets of young boys were required it would not be worth a parent's while to send them at all. There would not be room in the trade to take on the larger number in the higher stages of work. It is the hope of this which induces parents to send their boys to the lower. A glass house boy, owing to the nature and hours of his work, and the number of meals which he comes in for, is more costly to keep than a boy in other kinds of work. On the established system, boys who work at all must work in part of the night. I am not prepared to say up to what age boys could be dispensed with altogether, probably not older than 11. A boy would learn enough of bottle house work in a year to be fit to be then bound apprentice to bottle making. It takes some time to learn merely how to get out of the way of danger from the glass and irons.

Whatever may be the case in other kinds of glass work, it is not the case in bottle houses, I should say, at any rate not in ours, that only a small proportion of the boys who enter the lower stages are taken on to the higher. We have few who are not. It is true that the black bottle trade has increased very greatly of late years, and this of course creates a larger demand for boys to be taken on into the trade.

The system of work is the same in all the bottle houses of this northern district, viz. on the Wear, the Tyne, the Tees, and Seaton Sluice, as in ours. With a very few exceptions all are of the same size, viz., four holes, and employ men and boys in the same proportion. Whether five or six journeys are made depends entirely upon the demand in the trade for bottles, except in some cases, in which, owing to some imperfection in working the house, there may be an inability to make more than five. There are 28 bottle houses on the Wear alone, *i.e.*, in or near Sunderland, making with those on the Tyne and Tees and at a few intermediate places near the coast, about 50 in all. Sunderland may therefore be called the great centre of the black bottle manufacture.

Near our Ayre's Quay works there is a good school, which was built and started by one of our firm. We pay for tickets there for any of our boys and girls that wish to go, and several avail themselves of these when they have opportunity, and go to school sometimes.

The National school is at Deptford not far from our works, to the re-erection and enlargement of which we have lately subscribed.

It frequently happens that a pot breaks and all or a part of the metal is lost. In these cases the boys have holiday, receiving full wages as if 63 dozen were made, and cannot, under the present regulation, afterwards be called upon to make up the time lost.

181. *Margaret Ann Cook*, age 16.—Another girl turned 15 and I draw bottles from the arches, handing them out to two women. It takes us about 3 hours a day for each of the two houses here. Come at about 6 a.m. Do no other work. Get 6*s.* a week. It is warm work, and I didn't like it at first; have done it 3 years. You'd find it hot I warrant you, but it is always cool enough for me to get into the arch. Each time a crate is filled, which is in about five minutes, a crate holding 12 dozen bottles, I come out.

> [The manager, who has had an experience of 35 years in the work, stated that he had never known any persons but girls employed in the arches.]

182. *William Wallace Cook*, age 11.—Taker in. We are called always at 12 on Sunday night, and rather later other nights, perhaps 12½ Monday night, 1½ Tuesday night, and so on. Yesterday morning, Friday, we were not called till 4½, which is late for a Friday, and this morning at a quarter to 4. It's always about 12 hours that we are at work. Sometimes if the metal boils it hinders us, but I never remember being at work much over 12 hours. We come about half an hour before the men. A putter-up boy has to go and call them. Stop about a quarter of an hour or 20 minutes for breakfast, and about the same for dinner. Can read a little bit.

South Shields.

THE SOUTH SHIELDS BOTTLE COMPANY'S WORKS, SOUTH SHIELDS.

183. *Mr. Wm. Marshall*, general manager.—We have four bottle houses here. The bottles made are of the kind technically known as green glass bottles, or commonly as black bottles. The other kinds are pale and half pale, which include the smaller kind of bottles. We make usually five journeys a week, each of about 12 or 13 hours. The founding or out-work journey takes about 11 or 12 hours. The hands are called at about 1 a.m. on Monday, and, if all goes well, about an hour later each succeeding day. The boys are always called about an hour before the men. For a few weeks we made six

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journeys regularly. We did it because we were full of work. There was no difficulty in it. The houses were in such good order that I had merely to say, "go six journeys," and they did it. The hands were called every day from 12 p.m. to 2 a.m., and finished by 12 at noon. One day it was finished by 11 a.m. Even on Saturday we have finished the sixth journey by noon. So that with six journeys about half of each was night work. The cause of working so quickly was simply that the men were attending, being in good heart, and doing their best to get on. On the Wear bottle makers will not work after 4 p.m. on Saturday, but formerly working till 10 p.m. on Saturday was the rule in the trade.

The same company has six bottle houses at Seaton Sluice, under the name of the Hartley Bottle Company. I was there before I came here. They take longer, 13 or 14, sometimes 15 hours, in founding. The reason is because they use sand from the sea shore, which is stiffer. Here I have known the founding take as little as even 8 or 9 hours. This is sometimes from more metal being left over from the previous journeys, sometimes from softer sand being used, which will flux sooner. If it is too soft it cannot be worked well. There is a proper medium. There is no greater cost in using good sand than bad. Vessels bring it here as ballast, and the cost is very slight, almost nothing.

We could not, however, on any consideration, ensure regularity so as to have fixed hours of work. There are so many causes of delay. Pots breaking is one cause. Sometimes we attribute a hindrance to the materials being of different quality, as, though mixed in the same way and the same proportions, they do not melt so soon. Sometimes the coal will make a difference, though not when it is got from the same place and of the same kind. Sometimes the wind is the cause. I have seen boards put to direct the currents, but there are none such here. Some furnaces draw much better than others. A great deal depends on the position, *i.e.* whether the house is sheltered, or is well placed so as to catch the currents; and a great deal also on the ability and attention of the teasers. From one cause or other one house will sometimes be greatly ahead, and be called hours before another. I have known a house a whole journey behind. It is much pleasanter when they are all together. I have known the founding take 24 hours, but that is very rare, and arises from some unusual chance.

Sometimes after the men are called for the working journey, a delay arises, *e.g.* if the metal boils, *i.e.* if gas is bubbling up, which it will do though the metal is fully melted, when the gas has not had time to escape. This may not be discovered till the metal is skimmed and the men ready to begin work. It may cause a delay of from one to three hours. A boil may lengthen the outwork journey too. Or, after the working has begun, it may be stopped by the metal getting thick owing to its being too much cooled, either from enough fuel not being put in, or from ends of glass being dropped in from the pipes. These causes may of course be prevented by care.

It may be true that regularity in founding may be secured in some other kinds of glass. In the finer qualities, plate and flint glass for instance, the materials used are almost pure chemicals, and these can be reckoned on with much greater certainty. But bottle glass is made of the roughest materials that can be used, and which are liable to great variation in quality. These are chiefly sand, and ash made of calcined lime or marle, with ground clay to give a dark colour. The Wear is almost the seat of the black bottle trade, probably owing to the facility of getting good coal and materials, particularly the lime or marle of the neighbourhood.

Much more work is turned out now than was formerly in a given time. The nominal journey, *i.e.*, the amount required to be made in it by one hole is 63 dozen bottles; 75 was quite an average of what actually was made. Now 80 or 90 are made, and with pints from that up to 120. This increases the labour, but it increases the wages also. A quart bottle weighs 1 lb. 9 oz.

Two or three full meals are taken in each journey at intervals of about four hours. There is nothing to prevent having mealtimes of stated length, at stated hours in the journey. Formerly it was the custom in the bottle trade to eat and work. Men's wives would bring them their meals cut up, and a man would eat a bit, then work, then eat another bit. The boys consume a great amount of animal food.

The bottles are drawn from the arches by the putters up before the journey begins, and if not finished then, in breakfast time or somehow afterwards. The bottles put in to-day are taken out the day after to-morrow and so on, or if Sunday comes between they are in a day longer. If there was a demand we might venture on bringing some out earlier, but as a rule it is unsafe to hasten them. Drawing is uncomfortable work and causes profuse perspiration. It would not be at all healthy for boys to work at it continuously as a regular day's work; it would be quite improper. At Seaton Sluice girls draw the bottles and hand them out to women.

So far as boys' health and strength are concerned, they should not come into bottle houses till they are 12 or 13. Speaking from my impressions of ages, and without special inquiry, I should say that some boys begin to gather at 16, the youngest at 14, and some not till they are 18. Boys are always trying their hand in the intervals of work. The general custom in the trade on the Wear, is to bind them apprentices, but we do not either here or at Seaton Sluice, though they are the same in effect.

No ill usage or cruelty goes on. I have known it, but a man was always liable to fine or dismissal for it, and it has greatly gone out. Boys in fault are reported to the office here. But they cannot well neglect their work; when they once begin, they must go on; they are just the same as parts of a machine. In each house one of the bottle makers is also manager, and directs changes in the work, &c.

I should say that generally there is a great improvement in the character of bottle-makers since I have known the trade. There are greater facilities for reading, and a better class of amusements. At Seaton Sluice there was a master who used to let the boys come to school by day or night as suited, but they were far too knocked up, and wanted fresh air instead of school. Being a country place too their time was quite broken up, as they could run out on the sea shore, or bathe, &c.

184. *James Brown*, age 14.—Taker in. Here two years. We boys are called at 12 on Sunday night, and at 1 a.m., 2, and so on on other days, getting about an hour later each day. It is about 4 a.m. on Thursdays and 5 a.m. on Fridays. We are here about two hours before the bottlemakers start work, and they work for 10 or 11 hours; 11 hours is the longest. On the average we are here 13 or 14 hours. One day we were not called till dinner time; the metal turned that bad we had to stop work a bit, and so could not finish till 8 next morning. In this way I have been in the works twice for 20 hours, and once for 24 hours without leaving. Some of us would lie down on the floor and then others would come and wake us. Sunday nights I go to bed at 6, and sometimes, if tired, may slip to bed about 5. Have seen us called at 12 in the middle of Saturday; they wont let you work later than 10 on Saturday night. We stop for meals at about 5.30 and 8.30 a.m., and at 12 for dinner.

Sometimes the men will tell you to jump and do their liking, at other times they will just knock you down. You have to do what they tell you. Was never badly used myself, the lad there has been very badly used. (The boy referred to denied it, J.E.W.)

Feel weakly and tired; am tired when I have to go to the far arch; it is 16 yards each way, and I have to go backwards and forwards to it all day when it is used.

Can read a bit; (when asked to, wont).

The Glass Manufacture.

Bottle Glass.

Newcastle-on-Tyne.

Mr. J. E. White.

q.

The Blaydon Bottle Company's Works, Blaydon, near Newcastle-on-Tyne.

185. *Mr. William Thompson.*—I am manager of one of the glass houses here, and work in it myself as a bottle-maker. The branch of the glass trade carried on in these works is called the pale black bottle trade, and includes ordinary pints and quarts, and also bottles of many other shapes and sizes, as well as larger articles, such as carboys and retorts. The works consist of five glass houses, one only just built and not yet in use. In our trade we make only five journeys a week instead of six as is the practice in the black bottle trade. The reason of this difference is, that in the black bottle trade the sixth journey is paid for as overtime, whereas we should be paid for it only as part of a week's wages. We have to make 63 dozen pints or quarts or 70 dozen small bottles, *i.e.*, half-pints or under, in a journey. What is made above this quantity is paid as overtime.

A working journey lasts from 9 to 12 hours, very seldom as much as 13, not more than twice in the year. The boys are called about an hour before the men. The founding takes from 18 to 20 hours. The reason why our glass takes so much longer time to found than the black bottle glass, is that ours has more sand in it, and is harder to melt. Sometimes the founding takes longer, even as much as 24 hours. This is owing chiefly to a difference in the materials used, as the sand or alkali; not in the coal, we seldom change that.

We thus work day or night or any part of them promiscuously. We can see just as well at night by the mere light of the furnace without any other light. The first journey begins at 1 o'clock Sunday night, and we generally get done somewhere between midnight on Friday and Saturday noon. We give up at half-past 11 Saturday night anyhow, even if we have not made half the journey, but we reckon for full pay all the same. The boys are allowed the odd half hour to clear up before Sunday begins.

Any metal that is not worked out in one journey is left for the next and used then, and is just as good. Sometimes this happens, as it did yesterday, from one "hole" or set of five hands not being able to work, owing to one or two being absent. Then the other three sets work at the four pots, and put down moulds to suit, and make larger bottles so as to use up more metal. If the men are prevented from work by a pot breaking or anything not their own fault, they get half wages, and the apprentices full wages.

We stop about every 4½ hours for about half an hour for a meal, and renew the furnace in these intervals by filling afresh; but we stop at the 4½ hours just the same whether the furnace wants filling or not. It will go longer, as 5 or sometimes 6 hours, without fresh filling. No harm is done to the metal by this stopping.

It takes a good few boys to fill a glass house, more boys (*i.e.* under 21) than men at times, as there are sometimes apprentice blowers and even apprentice bottlemakers, no one being out of his time till 21. Boys are not strong enough for the lowest work, viz. taking in, under the age of 13, and it is not good for them. We seldom have any younger than 13 or 14. That boy, aged 12, is the youngest here now or that I ever had. About 14 is a good age to begin. Sometimes boys begin as old as 16 and get on just as well as others, but to do this they must have fair ability. I began as taker in at the age of 15, and after only two or three weeks became a putter up, and was a blower before I was 18. An ordinary boy could learn to take in in two or three weeks, and after 6 months would be fit to be a putter up. We always pick up the strongest and most able that we can. This is necessary, for in a glass house there is no one but what is busy. All are kept at it pretty well till we stop work. Takers in get 5*s.* a week and putters up 6*s.* with some overtime besides; say 6*s.* or 7*s.* on the average. A boy's getting on depends entirely on how he works, and how much the men help him. If he is a good-natured lad and takes to it willingly the men will help and teach him, and then he quickly gets on. Some never get to be more than a gatherer, though grown up. Where this happens it is likely to be boys who are awkward and crossgrained, and wont be taught. But I have known a boy get to be even a finisher by the age of 18.

Boys are employed here to draw the kilns, of which there are two in each house. This takes them 8 or 9 hours a day on the average, sometimes all day. They work between 6 a.m. and 6 p.m. Girls are not employed in this trade (pale bottles), so far as I know. The reason that they are in the black bottle trade may be that boys are scarcer in those neighbourhoods.

Yorkshire, especially the neighbourhood of Castleford is the chief district for making our kind of glass, and this company is sometimes spoken of here as the Yorkshire Glass Bottle Company, there being few works of the kind in this district. I worked at Castleford and had the same hours and plan of work as here.

186. *John Maguire*, age 15.—Taker in, make five journeys a week. Am called at 12 on Sunday night for the first. Finish sometime on Saturday, but we are not very regular; it may be morning or evening. The latest is 11½ Saturday night. We stop two or three times in a journey to eat, the longest time is about half an hour.

Stockton-on-Tees.

Mr. Bowron's, Glass Bottle Manufacturer, Stockton-on-Tees.

187. *Mr. James Bowron*, son of the proprietor.—We have four bottle houses here and three at South Shields. Here we make six journeys a week, beginning at 12 on Sunday night and finishing by 4 on Saturday afternoon, occasionally earlier. The time taken in founding is pretty uniform with good coal and good furnaces. We are seldom thrown out much. We have been established here a long time, have got into a well settled system, and have good hands. In starting new works there is great difficulty and loss, owing to the want of these circumstances. In this north of England district, *i.e.*, from here to Newcastle, there are about 50 bottle houses. More go five journeys than six. In our works at South Shields we make sometimes five, sometimes six. We cannot always make six there. If six journeys can be made regularly, it may be taken as a test that the house is in good working order. We are able here to save the necessary time in the founding. We have brick furnaces. Brick furnaces heat faster than stone, which are used in some places, and we can heat the metal more rapidly. We make from 80 to 120 dozens in a journey, on the average, say, 90.

The average age at which the boys begin the work is from 10 to 12 or 13, some begin at 9. The trade no doubt has found out the best age for their beginning. If these boys could only work half time, the question would be were to get boys from, as the supply is scarce. If a boy goes off, as one often does, another comes on and takes his place. Boys become wetters off, say, at 13 or 14, gatherers at from 15 to 17, blowers from 18 to 20, it may sometimes be by 17. The head man in a hole is called a bottle maker.

Each house has a woman and a girl to draw the arches. The girl gets in and hands the bottles out to the woman. It must be the girl who gets in because the place is low, perhaps only 4½ or 5 feet high. They generally start work at 6 a.m. and do it as they please. They like to finish the amount and then eke out their earnings by other day work, as there are women and girls in the yard who pile bottles, help pack, &c. These work from 6 a.m. till 6 p.m., with full meal times, and do not work longer. It is very hot work; one girl left it on the plea of her health.

There is a great mortality amongst glass makers

The Glass Manufacture.

Bottle Glass.

Stockton-on-Tees.

Mr. J.E.White.

q.

but I attribute this entirely to their drinking so much. There are very few teetotallers amongst them, fewer than in any class, I should say. Those who are teetotallers work quite as well or better. It is rare for glass makers to be attacked by fever, and would be rarer if their homes were clean. The work stimulates the skin very much. When the cholera was so bad at Newcastle, there were very few, if any, cases amongst glass makers. My father attributed this to their breathing air so full of carbon. It is a very hereditary business, and thus boys generally have a father, brother, or cousin in the works who would look after them, and see that they were well treated.

The boys generally have been at schools before they come here. In a night school, in which I am teacher, I have been pleased to see eight of our lads, boys of from 12 to 14, attending. After they have done work here they will go home, wash and go to sleep for an hour or two first, then go to a school, and get to bed.

188. *George Redman*, age 11.—Taker in. Am called at half-past 11 on Sunday night. Have never been in the works more than 13 hours at a time. Stop a quarter or half an hour for breakfast, and the same for dinner. Earn 5*s.* a week wages, and with the overwork 8*s.* or 9*s.*; it has been as much as 9*s.* 5*d.* Last week it was 8*s.* 2*d.* Mother gives me 6*d.*

Was at school before I came here. Can read, write, and do compound division. Do not go to school, church, or chapel on Sunday.

[A boy 9 years old, a taker in, (*Arthur Hills*) had done the same work near Castleford before.]

Yorkshire.

189. Castleford, till lately a village, but now, owing to the introduction and great growth of the bottle manufacture there a town, in Yorkshire, is one of the great seats of the bottle manufacture. The principal works there, those of Messrs. E. Breffitt and Co., were visited by another of the Assistant Commissioners, and an account of the system of boys' work there is given in the evidence collected by him (No. 243–245). A number of females also are employed at these works in various ways in the warehouse. The work includes also what is not common in bottle works, the grinding of glass for stoppers, &c. by steam-power. I went through these and most of the other works there, which, with four houses in the neighbourhood, comprise 23 bottle houses at work, and found a general resemblance in the mode of work. The glass houses of new construction were remarkable for their amount of light and airiness. This construction, which I have also seen in several places elsewhere, is said to be far cheaper than the old, and it certainly seems as if it must be more healthy for the workers. I noticed more colour in their complexions than is usual.

190. At one of the works I found a boy, aged 11, a taker-in, with his head tied up and an ugly festering hole beneath caused by a bottle thrown by a man, but it was stated that this was not done on purpose. I had some difficulty in getting at this boy to question him. The distance which he has to carry the bottles from the furnace to the kiln was said by him to be 15 yards, but on pacing it did not appear to be more than 10 yards. He said that they sometimes made 125 dozen in a journey, but at others 100 or so. The distance, taken both ways, with the higher number of times gives (125 × 12 × 20 = 30,000) 30,000 yards or more than 17 miles in the journey, or with the lower number a fifth less.

191. A medical gentleman, who accompanied me through the works, pointed out to me what a large proportion of the boys showed weakness of the legs and knees, some being almost knock-kneed, which he attributed to this great strain upon their ankles in their work at an early age. I noticed a boy doing the preliminary blowing of a large piece of metal which was to form a carboy, the largest kind of bottle made, no doubt to save the man some part of his labour, which is reckoned severe with this kind of bottle. See also No. 202, "It is only in making carboys that a boy blows behind," which seems to imply a general practice of this kind.

MESSRS. KILNER BROS.', GLASS BOTTLE MANUFACTURERS, DEWSBURY.

192. *Mr. Caleb Kilner.*—We make bottles of all kinds, chiefly the pale green, and we have 10 bottle houses, seven of them in our large works here, two near, and one at Conisborough. Each house has a four-pot furnace, and a set of five persons work at each hole, or in some cases when small work is made, two sets, and we make five journeys a week. This arrangement of the houses and workers, the kind of work made, and the number of journeys, are the same throughout all the Yorkshire bottleworks.

We have fixed the extreme length of a working journey at 11½ hours, *i.e.*, from the time when the founders finish their work and the bottle makers are called till the time when the latter leave off. At the end of the 11½ hours the bottle makers must leave off and the founders are called on again, whether the metal is worked out or not. The reason that we made this rule was, that we found the bottle makers often lose a deal of time, both in working and in coming to work, some not coming perhaps for an hour or two after they were called. If only some in a house did so it threw all the house behind, as the next founding could not begin till all had finished, and besides, there was the loss of having the furnace kept up for those who were behindhand longer than would have been necessary had they not lost the time. Now, if they do not come punctually and work regularly they have not the opportunity of making their full amount of work, so they do not waste the time. We did not find any difficulty in introducing this rule, and it is decidedly beneficial. At one time we fixed it as low as 10, and then at 10½ hours, but increased it to 11½, as trade was good, and we thought that we would give the hands the benefit of it. One hole makes on the average about 90 dozen in a journey, but the number varies greatly with the size of the bottles and other circumstances. Sometimes with small bottles as many as 140 dozen are made.

Allowing for accidental delays, the founding takes on the average 15 hours. If there are no delays, which however seldom happens, it may be done in 14 hours, but not in less, if the pots have been worked out. A house may go a month without the founding taking more than 16 hours.

The hands are called for the first working journey at 3 a.m. on Monday. It used to be at 12 on Sunday night, but we put it later so as to let the founders come later on Sunday, and so give them more of it to themselves, and also it allows the bottle makers more rest on Sunday night. Sometimes they used to come without having been to bed at all.

We do not, and have not for many years, made six journeys in a week. It is not convenient for us to do so. The founding takes up so much time. It could not be done without leaving a large quantity of metal in the pots, which would be a loss. Nor would the men like to work six. We could not therefore work six journeys, and so arrange to make the work fall in the day, notwithstanding that the outside limits of our present five journeys, including meal times, are only 57½ hours. The founders too would not like to have their work thrown all in the nights regularly. As it is, they sometimes try to delay the founding or manage somehow so as to get their work as much in the day as they can.

The houses all begin at about the same time on Monday, but some may be 12 hours apart by the week's end. This depends chiefly on the state of the pots. If the pots are new they will hold a full quantity of metal and so take the full time to work out. But in another house the pots will be old and cannot be filled, as they get worn down in front by running the pipe over the edge, or they may have cracks running a foot or more down from the top. These therefore are worked out sooner. If smaller bottles are being made, more metal has to be left in. We change all the set of pots in a furnace at once, as it is one trouble. If we left one or two in because they were apparently good, they might break and throw out the new ones. Pots last from four to seven weeks on the average.

Boys begin as takers in from 10 years old upwards, the wetters off at, say, 12 or 13, gatherers from 14 to 16, and blowers at 16; a boy may sometimes begin to blow at 14. They begin usually on the smaller work, which is much easier; there is a great difference in the exertion between making small bottles and large.

The work is healthy enough if the men are steady, but many knock up from drinking. They are a rough class. They cannot well go to school as boys when they have once begun bottle house work. We bought some books and formed a library here. Anyone that likes can take books home, but very few do.

193. *Patrick Sweeny*, age 12.—Draw the arches. Work at it from 5 or 6 a.m. till 4.30 or 4.40 p.m. Don't like the work very well; it is so hot. Have had a cold, and was in bed with it; have been hoarse ever since. The doctor said I had got the flames in my chest. Caught the cold by sleeping out in the furnace. Had been drawing all day, and at 6 p.m. had to take in for another boy who was away. Took in till 2 a.m., and then slept in the furnace till 5 a.m., when my next day's work began. Got 1*s*. for taking in for the other boy. The other boy who draws slept here with me, because he was afraid to go home and come again in the morning by himself. Have no fixed time for meals. Have about a quarter of an hour for breakfast, and the same for dinner, or can take half an hour then. Earn 5*s*. a week, and have 4*d*. of it for myself. Wash my face and hands at night, and my body once or twice a month. Have only one shirt besides what I have on; wear each a week.

194. *John Morris*, drawer.—Two other men and I draw all the arches, with last boy and another the same age to help us. We draw 70 arches in a week, which takes from 5 or 6 a.m. till about 4.30 p.m., and earlier on Saturday. If one arch is too hot to begin, we go on to another which is cooler.

[The arch which they were then drawing was at a temperature of 106°.]

195. *Samuel Forth*, age 10.—Was 8 or else 9 when I came here. Was first in the yard for a few months at day-work, making rolls of clay for making pots. Then was taker in; am now wetter off. Taking in is easier than wetting off; wetting off is warm in summer. We are called at all times; can't tell you when. On Mondays it may be 3½ or 3 a.m., sometimes 5 a.m. or breakfast time. Ought to have been called about breakfast time to-day, but it is drinking time now, *i.e.*, 4 p.m., before we are called. It is 11½ hours from the time we are called till the time we give over, never longer. It used to be 10, then 10½ hours, but was made longer because they thought that we could make more bottles, I expect. Sometimes make 110 dozen in a journey. Some on 'em can make 120 dozen. Can work a pot out in 11 hours. Came on yesterday at 3 in the morning, and was here till 11 at night; we were not making bottles all the time, but were "laking" about till the other holes had got done. When we have done, we like to "lake" about, whether we are tired or not. Sometimes we are tired and want to give over. (On referring this statement to one of the Messrs. Kilner he stated that the boy's account could not possibly be true, and on referring back to the other men in the house it appeared it had not begun work till 3 p.m. The boy, however, kept firmly to his account. The most probable explanation is, that, owing to the irregular mode of work, the boy had lost the power of discriminating properly between day and night, and called 3 a.m. that which was really 3 p.m., because it came soon after he had got up.—J. E. W.) Will be on 11½ hours this journey, I gain, and finish by 3½ or 3 a.m. to-morrow (*i.e.*, on Saturday). Then will get things ready to set pots, which will take, may happen, till dinner or breakfast time, or before. It takes several hours. When they set pots we boys have to pug up clay, and the muck and bricks to get out, and to sweep up. Get 2*d*. for helping to set pots. Don't like it, because it daubs us and sich; sometimes we go home so as not to do it. On Monday we shall not be called till breakfast time, the pots being new. Sometimes want to give over before a journey is done. Stop twice, or sometimes only once, in a journey for a meal, sometimes for an hour, sometimes half. Always get as much as 6*s*. a week wages, and perhaps 2*s*. 6*d*. for overwork.

Sometimes the boys are hit by the men, and run home and tell mother, and she fetches a summons on 'em (the men), and the men go to prison if they have leathered the boys. Sometimes the men poise us with their foot as hard as ever they can, or hit us with their hands, or fetch sticks to us. If a 'prentice goes home and doesn't work a journey, he has 7*s*. 6*d*. to pay.

Sometimes we get colds with running out of the glass house. We (boys) sometimes drink beer at work. The men drinks drink, *i.e.* ale, which they send us out for.

[A boy carrying lumps of clay for the pot makers was panting with his exertion.]

196. There are bottle works scattered about in other parts of Yorkshire, carried on in some cases in connexion with flint glass making. The two following statements give an account of bottle works in two villages which I visited some miles north of Rotherham.

197. *Mr. Josh. Wilson.*—I am partner in a firm of glass bottle manufacturers at Swinton. We make five journeys a week. The hands used to be called at 11 on Sunday night, and are so still, I believe, in some places, but we have altered it to 1 a.m. on Monday. We are not at work more than 11 hours in a journey; we are sick enough of it by then. When there are pots to set, the hands are kept longer, it may be as much as 18 hours altogether. Big boys help at that. A journey begins as soon as the metal is ready; that depends chiefly on the fuel, and also on other things, such as weather, &c. You can shut the draught off. It has been tried for years to get a regular system of working, but they never can do it. There is a great improvement, however, since I was an apprentice. Then we were called at 11 on Sunday night, and for two years I never got home on Saturday night till 11 or 12. You hardly saw daylight. The furnaces are better arranged now. There are three bottle houses here. They reckon for boys to go into a bottle house at 12 or 13. Some go younger, if their father is dead. I once saw a boy of 8 years old working in a bottle house, or rather trying to work, for he was not properly able.

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198. *Alfred Dunhill.*—Gatherer in a bottle house at Kilnhurst. Make five journeys a week, each of about 12 hours. We are called for the first journey at about 11 Sunday night, for the second at 2 or 3 a.m. on Tuesday, and each following journey begins a few hours later in the day than on the day before, but it is very uncertain when you begin. Sometimes I am 18 hours at home before being called. Worked six journeys one week. There are four glass houses at Kilnhurst, but only two, viz., one bottle and one flint, at work at present.

The Glass Manufacture.

Bottle Glass.

Stourbridge.

Mr. J. E. White.

q.

MESSRS. WESTWOOD AND MOORE'S, GLASS BOTTLE MANUFACTURERS, STOURBRIDGE.

199. *Mr. Edward Windmill*, manager.—The glass made here is "green glass" for bottles of all sizes from the largest "carboys," holding many gallons, to a medicine bottle. Some of the boys take in to the annealing arches, but the large bottles must be carried by men, who hold them over their head: 10 lbs. is the regular weight for a 10-gallon carboy; a lad would not have strength to carry this, or at any rate could not be trusted to put it in safely. Other boys "put up." They put a spot of water to make the glass break off from the iron.

Very few bottle houses, even of the better kind, work at all regularly; they take it all hours, as much in the night as in the day. We used to be the same; but by perseverance and getting a bigger heat we have gained time in founding, and to a great degree overcome the difficulty. The chief improvement has been by getting a draught from both the top and the bottom, instead of from the bottom only as we used to have. This works easier, and gains time. But we cannot tell to two hours how long the founding will take. It is usually from 12 to 14 hours, it may be 16, but if beyond that it makes the work bad. Only three persons, men, work at this. It is usually managed so that the journey can begin in the morning, the boys coming at 8½, 9, &c., and there are five journeys a week. The length of the journey in bottle houses all depends on the kind of work made. Sometimes it is 14 or 15 hours. After the bottle is annealed it is finished; requires no cutting or further work; and also less skill is required than in flint glass, as the bottle is blown in a mould. Boys are bound apprentices at 14 or 15, seldom later than 15. There ought not to be any bottle-glass makers who have not been apprentices.

200. *Edward Windmill*, age 10.—Was 10 yesterday. Here a year. Taker in. Come to work sometimes at 3, 4, 6, or 11 a.m. Have begun at 6 at night, but that is a good while since. Have come at 2 a.m., 1 a.m., 1½ a.m., and 11 p.m. Mother calls me. Began work this morning at 8½; will have done by 6½ this evening, but we boys, 11 altogether, have to draw the kiln also. We come earlier to do this nearly every day. Don't know how long I stopped for breakfast or dinner to-day; we keep no time. Don't all stop together, but go by turns. Sometimes also stop if it is too hot to work. Wash every evening. If I am away from work, they get some one else. Can spell "cat" and "short." (Does from sound.) 3 times 11 is 32.

Bristol.

201. The only bottle works which I could hear of in the south or west of England are those of the Messrs. Powell and Ricketts of Bristol. These are of fair size, consisting of three houses. The system of work as described to me by Mr. William Powell, one of the firm, corresponds with what is described as found in bottle-works elsewhere, except that the working periods in these bottle-houses are shorter than usual, 10 hours being considered a long working journey. Six journeys are made in a full week, *i.e.* when the state of trade and other circumstances are favourable, without being carried late on Saturday or beginning so early as usual elsewhere on Monday, so that under these circumstances the working journey must necessarily fall considerably within the period of 12 hours. Mr. William Powell, though stating that his firm had always been most anxious to do everything in their power to promote the welfare of their workpeople, expressed the strongest possible objection to any legislative interference with their manufacture. He is also one of the owners of a pottery in Bristol which falls under the recent Factory Extension Act. The short expression of his views was this:—"I really do not see "how it would be possible to carry on a business so peculiar as bottle-making under legislative "restrictions, such as those which have lately come into force in potteries, or anything like them. "They would in effect take the management of the business out of our hands. My present feeling is "that I should prefer to give up the business. Experience might possibly alter my views, but at "present what I have said is my most decided conviction."

Edinburgh.

THE EDINBURGH AND LEITH GLASS COMPANY'S BOTTLE WORKS, LEITH.

202. *Mr. Thos. Dobeson*, manager of the glass houses.—Both houses start work as near the same time as may be, but we cannot be sure of the time. On the average the journey begins on Monday at 2 a.m., Tuesday at 8 a.m., Wednesday at 2 p.m., Thursday at 9 p.m., Saturday at 3 a.m., each lasting about 12 hours, and there being only five in a week. In each journey there are two stoppages of about three-quarters of an hour each, for putting the furnaces to rights, and in these times the hands get a rest and take meals. The boys are called first by a man and come and get things ready, and then each goes and calls a man. Thus on Sunday night the boys are called soon after 12, and other days about an hour before the men begin. Formerly the boys were called at 10 p.m. on Sunday, and everything was ready to begin work as the clock struck 12, but this has not been so for the last eight years. Each hole or set of workers, *i.e.*, three men and two boys, make from 100 up to 150 dozen bottles in a journey. Including six boys in the warehouse and yard, who also draw the arches, there are 24 boys in the works and 56 men. The youngest boys are 12 years old or upwards. The wetters off are generally from 14 to 16. It is only in making carboys that a boy blows behind, but we do not make them now. (Cf. No. 191. J. E. W.) The wetter off has nothing to do with blowing. The warehouse boys work from 6 a.m. till 6 p.m.

I have been in glasshouses, either working or as manager, for nearly 30 years, and am acquainted with all parts of the work. Till four years ago I had always lived in England, and was in bottle houses in Lancashire, near Castleford in Yorkshire, and in the North of England. Our plan of work here is nearly the same as the English, except that in the north of England they tease quicker, because their materials are better, and they can thus make six journeys a week. The chief thing is that they have better coal. They, however, only do the same amount of work in the week, viz., 60 hours. Making six journeys is an advantage. Here the founding, from beginning to end, takes on the average 15 hours, and there only about 12. By the north of England I mean the district near the Tyne, the Wear, and the Tees. In Lancashire and Yorkshire they are situated more as we are.

Accidents hinder us, such as the negligence and carelessness of the founders, *e.g.*, if they get drunk, the breaking of pots, and the weather. Dull weather has an effect on the fire, and causes delay. Pots can often be mended.

The work, I think, does not interfere with the boys' health, if they get their meat and rest regularly. The only thing is, that they are apt to run about in the afternoon when off work, instead of going to sleep. The arches are generally cool enough for the boys to go into, the bottles having been left in over a whole clear day. If they were taken out too early, there would be a risk of their breaking from not being sufficiently annealed. The boys sweat tremendously, but they take no notice of it.

There are no accidents of consequence, only a dab from the hot metal now and then. We generally have slippers for the men and boys to work in, so

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that if any metal drops in, they can shake it out directly. With boots this could not be done. I have known a burn in the ankle from glass falling into the boot lay a person up for two months.

Boys in glass houses have been exposed to very ill treatment, but I believe that it is better now, and have heard men make the same remark. This I attribute to managers taking it up more and not allowing it. I know many managers and believe that they attend to this. I should never allow striking by the men. If a boy were idle and impertinent, and the men were to tell me, I should correct him. But I have heard the men here speak of how boys used to be treated, *e.g.* struck with the shears, or the cage (an iron instrument for holding the bottle with a long iron handle weighing perhaps 10 lbs.), and knocked down in the hole (*i.e.*, work place). I never saw a boy struck with an iron, but even since I have been here I have seen a man throw an iron with a lump of hot glass at the end at a boy. In England I have seen men take straps and leather the boys, and on going into a glass house in the north of England I found a hole lying idle because a man had struck a boy with an iron, and the boy had run away. Boys would, I think, dare to run away if ill-treated, and they thus have the power of throwing the men out, so it gives them some security. Parents, however, often send boys back when they run away. I have had to pay a man for taking a boy's place for a short time, as much as a boy would work for for a fortnight, a boy having run away on account of bad treatment.

The boys here are illiterate and there is great need for improvement in education, but on the whole I think that they are better educated than they are in England in the same occupation and class of life. For one thing we cannot get boys here so early as they do in England. The young boys are not old enough for the work, and they are running about out of doors more. There is little difference as to the kind of work. In England the boys are able to do the work, it is true, but it is because their parents make them. In England boys are far quicker for work, but here for mischief. You may take it generally in going through the three kingdoms and the different trades, that children in England begin work younger, and get to men's work sooner. Here, for instance, a boy generally begins to gather at 16; in Yorkshire he sometimes reaches the top place by about then, and often before he is grown up.

This, however, is not, I think, the only reason why they are better taught in Scotland. In England schools are cheaper indeed, but parents do not seem to care about education so much. They say of their children "they may do as we did." In Scotland there seems a desire for education on the part of the parents as well as on that of the children. Still in a bottle house the boy's only chance of getting to school in the week is on two or three evenings, and very few attend to do much good.

Another bad effect of the work, one of the principal indeed, is that the boys from being with the men so much, hearing all their talk, going for their drink and having sips of it, get to drink and smoke, &c. so early. Boys of 16 now get drunk as easy as the men.

It is quite right that these matters should be inquired into, and it is of great consequence that boys should be educated and kept at school, if possible, till 12 years old. We do not take them younger, but should find it inconvenient not to be able to have them from that age.

[The boys were off the premises at the time of my visit.]

Glasgow.

Messrs. J. and W. Geddes', Flint and Bottle Glass Manufacturers, St. Rollox, Glasgow.

203. *Mr. J. Geddes.*—The black bottle manufacture is carried on largely in Scotland. There are seven firms in Glasgow, including ourselves, one at Leith, one at Portobello, and one at Alloa. The largest has four houses or furnaces, others three, two, or one. Altogether there are in Glasgow about twelve bottle furnaces. A furnace usually has four holes, in some cases six. Five hands work at a hole, viz., the finisher, the blower, the gatherer, the putter up, and the taker in. The two latter are boys, usually from 12 or 13 to 16 or 17 years of age, and gatherers are put on somewhere about the latter age, sometimes earlier. There are other men employed in connexion with the work, as teasers, labourers, &c., and a few boys.

The usual practise in Scotland is to make five journeys a week, the first beginning soon after midnight on Sunday, and the last ending on Saturday afternoon at 4 o'clock. No matter how late on Saturday the last journey began, the men will not work one moment after 4 p.m. Whatever metal is left unworked is used in the following week, but we have seldom any left so then, worth speaking of.

Formerly our first journey used to begin at 12 on Sunday night, but of late years, *i.e.*, within 20 at any rate, our men have preferred not beginning till 2 a.m. on Monday. The reason probably is that they find that there is plenty of time still left in the week to get through their work in, and that they require the sleep on Sunday night to fit them for it. If a man had to begin at 12 he would perhaps think that there was no good in going to bed for only two or three hours, and so would come unfit for work. The two hours earlier start did no real good, as the men would only think that they had plenty of time, and would not use it so well.

Of late we have been making usually six journeys a week, but not long enough to decide finally which is the best plan. About the same amount of work is turned out in the week on the whole. The question to decide is, which is the most economical way of doing it, whether by making a larger amount in each of the five periods, or a smaller in each of the six. When six journeys are made, each working period is about two hours shorter than when five only are made. Our manager seems to think that the six journeys are easier for the men, and it certainly gives them their work at more uniform times, and so leaves more regular time at their own disposal in the evenings. It may turn out, however, that the six journeys wear out the furnace sooner, or that in some other they are not so profitable on the whole.

Whether five or six journeys are made will depend greatly on the manager. If he finds making six easier for himself, or that it pays him better, he is likely to make six suit. Our late manager, whom we had had 10 years, never attempted six. Again, the men may have a fancy one way or the other, and if they have a decided objection to either way, it would be difficult, or impossible, for the master to force them.

When six journeys are made, the time taken in founding must of course be shorter. We take on the average now about 13 hours, but when five only are made the time averages, I should say, as much as 16. The time is gained by our leaving more metal in the pots unworked. When we made five, we worked the metal down to as low as it could conveniently be gathered, *i.e.*, to somewhere about four inches from the bottom. With six journeys we leave about eight or nine inches. This makes the next melting quicker, the pot being warmer, and there being less fresh metal to melt.

It would not be possible to arrange so as to make the working period fall regularly within the 12 hours of day time. Many circumstances happen which delay the process of founding, it may be by as much as several hours. I have known the founding take 18, 19, or 20 hours. These circumstances are such as we often find out only in their effect, and cannot trace

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to their cause. Success in our business of course depends greatly on our being able to do so, and we try as far as possible, but the causes are very difficult to detect while in operation, *i.e.*, till it is too late. The chief are the breaking of pots, the neglect of the workmen, badness of coal, or of any of the material used, *e.g.*, if the ashes used are not properly burned, or a defective state of the furnace. In fact carelessness in any part of the work is sufficient. As to the pots, all that we can do is to make them carefully and season them well before being used. The expense of this is considerable. In Scotland it is customary for glass manufacturers to make their own pots. We employ no boys in it, and only one female, a woman. A pot will only stand a very few weeks, say three or four, without being patched, and after they are patched they are much more liable to break. I know a case lately, in which out of six pots which had been patched, five broke in the first journey. In any case we take pots out at the end of six weeks, as if they are not broken by that time, there would be great risk of their breaking.

If the founders are off drinking, or are not in a humour to attend to their work properly, it throws the work behind. The pots are often ready an hour sooner on one side even of the same furnace than on the other, simply because of a difference in the men who work at the opposite sides, though the coal is put into the same furnace. This week the metal should have been ready at 5 p.m. on Sunday, but from some cause it was not till 4 a.m. on Monday. Of course no one admits the blame, and we often cannot find where it is.

We could not diminish the size of the pots and so reduce the period of founding and working. We must make a certain quantity of work to make a profit. It would cost nearly as much in fuel to heat the smaller pots as the larger, and the space required, which is now very costly, would be nearly the same. Also, a man who had been accustomed to the high wages earned by making a large quantity in a journey, say 150 or 120 dozen, would not take off his coat to make a much smaller, say 80 dozen. The high wages are a great thing for the boys too, as good feeding is the grand thing for them. If they worked fewer hours, and earned only 4*s.* or 5*s.*, that would not keep them. If they are half-starved they are no good.

The working journey is also much lengthened sometimes by accidental circumstances. I have known it 14 or even 15 hours. When this happens it is usually from one or more of the men being off drinking, so that the other hands have to make up by dividing the work amongst themselves as they best can. This "single-handed" way of working, as it is called, is so ruinous that we try to avoid it in every possible way; we keep a few spare hands, men as well as boys, chiefly for this purpose, finding it to our advantage on the whole to do so, though it is a great expense.

The amount of work turned out in a week has much increased from what it was formerly here, and is in parts of England. This is partly owing to mechanical causes, such as the open and shut, instead of the simple open, mould, and a mould in which the kick at the bottom is formed by the putter up, instead by of the finisher at the marver. Partly also the men work harder. The stated number required to be made by one hole in a journey, for the stated wages, is 62½ dozens. All that is made beyond this is paid for as overwork, and makes a great part of the earnings, being often more than equal to the stated number. In a fair journey, if making pints as well as quarts, we can get as many as 120 dozens, even when working six journeys, and when working five journeys, have as many as 140 or 150 dozens. But the number depends very much upon the workers, and many make much less, some perhaps only 100.

The wages are very good. To take the present week as a specimen, the wages will be about as follows, viz., finishers from 6*l.* to 8*l.* a week, blowers, 3*l.* 10*s.*; gatherers, 2*l.* 5*s.*; putters up 1*l.* 5*s.* to 1*l.* 7*s.*; and takers in 15*s.* They would seldom, if ever, be much more, and might in many cases be a good deal less, but this is not much above what we have been in the habit of paying lately. Boys and all are paid directly by us. Though the amount of work done will vary, employers in the same district must naturally pay their hands at the same rate for the same kind of work.

We have also two flint glass-houses and a cutting shop. The hours and mode of work are the same as those usual in England. We make some pressed flint glass also, but very little of this is made in Scotland. The only other flint-glass firms in Scotland are two in Glasgow and three in Edinburgh. Their system of work is no doubt the same.

Boys must be at least 12 or 13 to be big and strong enough for a glass house. If they are weak or delicate or too small they are of no use, and cannot rise in the trade. The age at which they get to be gatherers depends entirely on their strength and ability. Some never rise to be anything higher all their lives. They are awkward, and seem as if their hands were not put on the right way, so to say. It is a strange thing, but is generally the best behaved boys in which this is found. The boys are generally small for their age. This, I think, is because glass making is hereditary work, and the men marry very early.

We never have any complaint of ill-treatment. We give very strict orders on this point, and allow no one, not even the manager, to strike a boy. If any case came to our notice we should at once hand it over to the police. It is a shameful thing for a man to ill-use a boy. Fines, which we used to have for different offences, are apt to create ill-feeling towards a master, and we gave them up. The boys are generally under their fathers, and thus well cared for. Cases of brutal treatment, such as boys' heads bleeding from being struck with the irons, used to be talked of, but that would only be where stranger boys were at work.

There is no use in any law to prevent boys working too much. That is grounded in the glass-makers' nature, and their independence secures that better than any Act of Parliament. It would be a dangerous thing to interfere by law with the working of the boys; they are far too well cared for already.

There is ample time for the boys to go to school in the week if they wished; for the flint-glass house boys on Saturday, and generally on Fridays too, and for the bottle house boys most evenings. But so far as I have seen, the greater amount of education which some of the working classes have had of late years, has not done much good, but on the contrary is dangerous, making them too independent. I have been in the trade all my life, and there were fewer difficulties from workmen formerly than now. They are very obstinate, and will not adopt improvements, though shown to them to be such. The proper education of boys is of course an important question, but the real difficulty, and one which cannot be got over, is the bad example set them at their homes. It is plain that it is not want of time which keeps boys from getting to school in the week, for they do not go any more on Sunday, when at any rate they have time. I should say that scarcely any, if any, go to church either, not even those who are better taught and can read and write. One or two of the glass-cutting boys go, I think. Some say that they have no clothes to go in; but at any rate they have wages enough to get clothes. Indeed it is sad how little good the high wages do. One boy whom you were speaking to has, I believe, not a stitch of clothing beyond what he has on now, and I question if the family have more than straw to lie on. The grandfather was arrested for debt; and yet 8*l.* or 9*l.* a week go home from here to that family in wages. Instead of schools, boys go to low shows.

204. *John Dermott*, age 14.—Taker in in the bottle house. Went as taker in at a bottle house at St. Helen's, in Lancashire, when I was 8 years old. Had gone there some time before to larn taking in; went first when I was going in sieven. Used to go at the first stop (for a meal) and work till the second stop, about four hours. Worked for father. Used to take in, fetch drink for the men, go messages, &c.

Have made six journeys a week ever since I have been here, *i.e.*, nine months. Not always; when they

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are setting new pots we only make five. We (boys) are called at 12 Sunday night, and the men start work at about 2. A man calls us first, and then we have to call the other men. Them that's tired and sleepy don't come perhaps, and sometimes we have to go and call them twice. We come earlier than the men to clean the irons and moulds, sweep the holes, make up clay, &c., and before starting the men have to skim the pots, and take the stones out. If there were stones in it it would make bad bottles. That takes them about an hour. We are always called an hour and a half or an hour before the men start. Tuesday we are called at about 2 a.m.; Wednesday at 2½; Thursday at 3; Friday at 4½; and Saturday at 3. The men hurry up the teasing on Friday night so as to begin early on Saturday, and finish by 4 in the afternoon. With six journeys, the teasers is only about 12 hours in teasing.

When we are making six journeys each takes 10 or 11 hours after the men start; and when we make five each takes 12 or 13 hours after. We stop half an hour for meat once in a journey when we are making six journeys, and twice when we are making five. In the half hour I have to sweep up the hole, but that only takes five minutes.

Have worked at three other bottle works in Glasgow besides, (*names three, including the two largest,*) as well as at St. Helen's. At all four we made five journeys a week, and just in the same way as when we make five journeys here, with the same two stops for meals. At one place here (the largest) we made six journeys for six weeks, but we could not keep it up. Like the six journeys best, because I get more time for sleep and make more money. Get 12*s.*, 11*s.*, and 10*s.* a week usually; 10*s.* is the lowest, and 13*s.* the most.

Like the work well enough; never mind the heat. Father and my two elder brothers, who are blowers, work here, and they always watch me, and see that I do my work. None of the boys are hit. Did not get drink for myself when I got it for the men. When a new furnace is put up, the takers in have a bottle of ginger (beer) each, and the putters up and gatherers glasses of whiskey.

Do not know the letters. Don't know what a violet is. (Q.—A rose?). It's the shamrock, and there's the thistle too. It's like a round round ball, all nice and red. Have heard of Queen Victoria. What I heard was that, when she was at Dublin she said it was the manliest place in the three kingdoms. Was at school when about six years of age, but only stopped a fortnight. Could not attend and wanted to be at work. My brothers took me to a Sunday school for six Sundays, but they quitted, and I could not go alone; we lived o'er far. Mother is going to send me to a night school, as with six journeys we get every night to ourselves. One taker in and three putter up's have gone lately. Was at one mass, but that is all I've ever been in church. Was never taught to say any prayers. Mother has read out of the Prayer Book about Jesus Christ being put in the coffin, and awake, and alive again. He takes care of the good, but don't like the bad. No; don't think He does like ye if ye 're bad, but He does want ye to be good. Mother axes me to go to school Sunday nights, and to go to church with father; but I'll no go. I don't like to go with him, and would sooner go with my brothers if they would have me. But I stay in the house all day, unless I come up to the works to see how things go on, and if there are any pots broken.

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205. A few young boys, two aged 8, one 9, and one 10, work in a warehouse handing bottles to and from the packers. Their hours are from 6 till 6 with two hours meals. On rare occasions they work a little longer. It was stated that this had been till 7 only twice in the last six months.

206. *Mr. Thomas Pincock*, manager.—The hours of work cannot be stated exactly, but on the average they are very much what the boy (No. 207) has said; indeed I was surprised to hear how rightly he gave them. The hands used to work till 10 on Saturday nights, but now always stop by 4 on Saturday afternoon. Men and boys are all called at the same time here, and by a man; boys have not to go and call men unless some are lazy and do not come. If they are called at say 12 Sunday night, they are not here much before 1 a.m., and they give over about 2 p.m. On any day from the time they are in the works till the time they leave is on the average about 13 hours, but this is only five times a week. A hole can make 12 dozen bottles in an hour, and I have seen 14 dozen made, but 10 dozen is the average. The working journeys are never lengthened here. Where they are, it is often from laziness. We can avoid it by good management. For instance, if after the men have come, the metal is found not to be fine enough, the teasers used to be called back to make it fine. This might lose 2 or 3 hours or more. Instead of this, we now in such a case make a different and cheaper kind of goods for which the metal will do, though not properly fine.

Most of the time between the journeys is taken for the founding, on the the average about 16 hours. Things will happen to make it longer sometimes, and occasionally shorter; *e.g.*, a difference in the coal, broken pots, weather, accidents to the furnace, &c. I never saw a week through but what there was some irregularity. A found may perhaps take 18 hours or more, but we might go months perhaps and not once have it as long as 18 hours.

If it were necessary it would be possible to arrange so as to make the journeys fall in the daytime, but it would give others always night work. They are only men. But I think five journeys better than six, and should not like six so well. Use has no doubt a good deal to do with this. But as much work is made in five journeys, I think, as in six, or more. With six there is more loss of time in starting, as it takes about 2 hours each time to get ready to start. Five is the general custom in Glasgow. The general system is the same as in these works. I have been in these works 20 years and in the trade 38.

Boys are not suitable for a glass house much under 12, and if they come much older they are getting stiffer and less handy. Few come so very young now. I began at 7 years old. There are the usual workers at each hole, viz., five, but two of our bottle houses have six holes each hole, the third four. Till 8 years ago the glassmaking boys used to have to draw the arches besides their other work, doing it in mealtimes, &c., which was very hard. Now three separate boys are employed for this, and they take turns in getting inside the arch. Girls, I believe, are not employed in this work in Scotland.

The boys' accounts are quite right, except that I never heard of that one (No. 207) having fits. He did fall down once, it may be twice, from the heat and had to go home. It was very hot weather, and then sometimes even the strongest men will have this faintness come over them.

As manager I see that the boys are well used, and one of the workmen is manager in each house under me. If I knew of a man striking a boy I should reprimand him, and if he were in the habit of it, he would be dismissed. But of late years there has been no serious ill-treatment here, except a case which happened about two months ago. The boy complained to the police and they came down for the man. I inquired into the facts and procured proper witnesses, but somehow the man was let slip. He had only been here a very short time, and we have discharged both him and the boy. Neither of them was satisfactory. It appeared that he knocked the boy down and kicked him repeatedly when down, six or eight times it was stated. He seemed to be a passionate man, but was not drunk. It is 10 years since I remember any boy being hit with an iron.

There used to be a school close by attended by boys from some works of other kinds, to which our boys could go free, but they did not appreciate it, and we have given it up.

207. *George M'Kenzie*, age 14.—Here 4 years. First drawed the arches, then was taker in, and for a year have been putter up or wetter off. Taking in was the best. Didn't like the drawing, it was too hot. It took about half of each day. Mother said I was getting bad at it with cold from coming out into the cold air after being so hot. Do not like putting up. Have a pain in my side at it sometimes from the heat and the sweating. I had a fit from it and fell down in the bottle house. Have a cough and speak hoarse like this always, but have been so all my life. Father is hoarse too. He works here as a spare hand and also blows.

Sunday nights we are called at 12 or a little after, Tuesday about 8 a.m., Wednesday about 2 p.m., Thursday about 10 p.m., and Saturday about 4 a.m. It is about an hour and a half or 2 hours before the men start the journey, and that takes about 11 or 11½ hours, not ever much longer. Stop twice for meals, about half-an-hour each time, sometimes 20 minutes. Just shovel up the glass in these times. Always give over by 4 p.m. Saturdays. Go to bed on Sunday nights at 7 when I come out of school, and in summer rather later, as at 8 or 7½. Can't sleep so well by day as by night, the horses and carts going up and down keeps you waking.

Get 10*s.* and 11*s.* a week with the overwork. Mother gives me 6*d.* for myself, and father used to give me 6*d.* too sometimes. I used to take it to the bank myself, and had 17*s.* saved up, but when my little sister died they buried her with it. Father and mother told me to draw it, and the bankman asked me "was I going to draw it?" and I told him it was to bury my little sister. I have not put by any money since.

They are kind to me here, but sometimes if you spoil a bottle they are not. One man drawed his hand back and blackened my eye.

Go to school Sunday night. Never was in church except three Sundays. Have no clothes. My trowsers are not so very well, and I have no others. Father is always in wages here.

[Very husky, has a cough.]

208. *James Dunn*, age 14 (?).—Don't know how old I am. Came at 9 years old and helped pack in the warehouse. Then was drawer, now take in. Like taking in better than drawing. My wages are 5*s.* a week, but with overwork it is 8*s.* and 7*s.*, sometimes as much as 11*s.* Get 6*d.* for myself, but never put any by. Go to the Colliseum with it and see niggers. Get plenty of water here; no other drink.

Never was in a church in my life. People sing psalms and read there, about Abraham, and Adam and Eve.

[Face caked with black dirt, ragged. Said to be 14, but looks much smaller.]

MR. M'ADAM'S, GLASS BOTTLE MANUFACTURER, GLASGOW.

209. *Mr. M'Adam.*—We make five journeys a week, the first beginning very early on Monday morning, and the last ending some time on Saturday, always before 4 p.m., often before breakfast. When the metal is ready for working the drink tender calls four boys, and they go and call the other hands. The working journey, including an hour or so required to get ready for starting, and two meals of about three-quarters of an hour each, takes 12 or 13 hours, and the founding on the average 16, or a little more; sometimes the founding takes only 14, sometimes 18 or even 20. Roughly speaking the working journeys begin about as follows:—The first between 12 and 1 a.m. on Monday; the second about 7 or 8 a.m. on Tuesday; the third about 1 or 2 p.m. on Wednesday; the fourth about 5 or 6 p.m. on Thursday; the fifth between about 11 p.m. on Friday and an early hour on Saturday morning. The boys who draw work only during the day time, and only part of that. I tried to make six journeys in a week, but I could not make the full six. My reason for trying was that I might let the men have their work in the day-time, which would be more agreeable for them. I only tried it for about a fortnight. The men would perhaps get less wages with the six, as where they work only five they get more over-work.

Boys come as takers in at from 13 to 15 years old. About 16 is the usual age at which they are made putters up. Some are not made so till 17 or 18. So far as mere learning their work is concerned but little time is needed. The work is almost mechanical, and has very little art. A boy of fair ability coming into a bottle house at the age of 16 could learn to be a putter up in a week or two, and might get to gathering in a few weeks. As a fact this seldom if ever happens, but there is no doubt that it might.

There are four holidays in the year, two days at the New Year, and two at Glasgow fair in summer; and for two of these days I pay the wages all the same.

The work is healthy enough if the men would not drink so; and it would not matter so much if they would drink beer, as they do in England, and not hard whiskey, which burns their inside out. But within the last few years there has been much less drinking amongst them than formerly. The only way in which I can account for this is by the general improvement of the working classes of late years. I also have very strict rules on the point, and heavy fines for men who are found in drink. The young boys do not drink, but they get to learn it too early, and they smoke too. In my pottery, which I also carry on here, I do not allow smoking. I think it objectionable for boys, and if they can be kept from it past a certain age, they do not seem to care so much for it, but when they are quite young they like to do it because they think it fine and manly. But in my glass houses I cannot prevent it. Boys are smokers when they come.

There has been a great improvement as regards the treatment of boys generally. The greater part of the men here would not strike a boy, and I am very strict to keep those who would from doing it.

The chief fault of the work for boys, I think, is, that they get too much money for little boys. Takers in get 5*s.* a week wages, and about 3*s.* for over work, and putters up 1*s.* or 1*s.* 6*d.* more. Getting so much money, they can almost put their parents at defiance.

About four years ago I built a little school and procured books, and engaged one of the men at a salary to teach them. Of thirteen, who came at first, in a few weeks all dropped off but three, so it was of no use to keep up the school. The time was arranged to meet the work; *e.g.* if a journey was finished at 4 a.m., the man would take them till 6 or 7, or it might be before a journey began. The independence from having so much money was, I think, a great cause of their neglecting to come. The great bulk too are the children of Irish parents, and some of English, neither of whom are so careful of education as Scotch parents are. It would be a very good thing if there were any means of requiring some education of boys before they could come to bottle houses at all. If a boy can read, it is the making of him; if he cannot, he is likely not to spend his time over well; but if he can, he will sit down quietly and amuse himself. The penny periodicals, of which there are so many now, are complained of by some,

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but they have, I am sure, done a great deal of good, and indeed have quite changed the people within the last 20 years. Now, many will come home and sit by the fire and read a story, and go quietly to bed. It is of course of great importance to boys to have a comfortable home, and it is painful to see what places some are.

Owing to the way in which work used to be carried on in my pottery, the Factory Act has made but very little difference there.

Mr. J. E. White.

MESSRS. BURRON AND CO.'S, GLASS BOTTLE MANUFACTURERS, GLASGOW.

q.

210. *Mr. Charles Burron*, junior.—We make five journeys in a week. On Monday the hands are called at towards 1 a.m., but have not got things ready to begin making bottles till about 2. The journey finishes at about 2 p.m., or at latest 2.30. The time taken in teasing or founding the metal is from 14 to 18 hours, on the average say 16. After the bottle makers come, it takes an hour or two before they can start work. The journeys thus fall some hours later each day as the week goes. Also towards the end of the week the journeys become shorter than the first. The actual period of making bottles is not 10 hours a day taking the year through. In each journey there are two stops of 40 or 45 minutes, in which meals are taken, and fresh fuel put into the furnaces to keep up the heat.

If we were required to do without boys working at night we should have to make six journeys a week; in which case the working journey and the founding must of course be considerably shorter. If this is done anywhere successfully it must be with four pot furnaces. Three of our four houses have six pots each, and six journeys cannot be made profitably with a six pot furnace. (But Cf. No. 215, note. —J. E. W.) We tried six for a short time and had to give it up. Six journeys are more costly with six pots than with four. It takes longer of course to fill six pots than four, and during this time there is more waste of heat with the larger furnace. Two men fill the three pots on the one side, and two those on the other. And this loss would happen six times instead of five. Putting on extra men would not save the time, as there would not be room for them to work and get the material any quicker. The hole from which it is taken is too small. Again, if a pot breaks, the waste of heat from the delay is greater, the furnace being larger. Nor can a pot be mended so well in a furnace with six pots as in one with four; in fact, altogether we have not the same control over a six pot as over a four pot furnace.

In Scotland, however, it has become more usual of late years to build furnaces with six pots than with four, so that it is natural to think that they are found to answer best. The idea probably is that they will save fuel. Some manufacturers, however, prefer four pots, some six. We tried six journeys with a four pot furnace also some years ago, and did not find it answer. The men do not like changing to six journeys.

The beginning of a journey is often delayed. The chief cause is the breaking of pots. The materials used for bottle glass are of a much commoner kind and tend to injure the pots much more than those used for other kinds of glass. The other chief causes are badness of the coal and of the materials used, and the neglect of the men. We are not so advantageously situated here in these respects as bottle manufacturers in the north of England. They have better coal as well as other materials. They easily get marle, while we have to use kelp or burnt seaweed. This is often very stony, which causes delay and loss of metal, as a great deal has to be skimmed off to get rid of the stones. Anyhow they seem able to tease quicker, and probably would not find so much difficulty in beginning work at a stated time as we should. In extreme and rare cases it may happen that our founding takes as much as 24 hours, but taking one week with another the delay in founding from hindrances of all kinds is on the average about 4 hours in a week. This may fall all on one journey or be distributed amongst several. The different houses generally start at about the same time.

Time has been gained of late years by the use of more complete moulds, and of saucers to form the bottom of the bottles, but we cannot use machinery of any kind, and see no prospect of it. About 100 dozen at one hole is an average journey. The highest number is about 120. A dozen quarts weigh about 19 lbs.

Three boys are employed in each house to draw the bottles from the arches. They do not work regularly by daytime, but come at the same hours as the bottle makers. The bottles are left in the arch for three days before they are drawn.

From 13 to 15 is the age at which boys usually begin our work. A boy under 13 is too young. It is not good for his health, nor is it safe. He is likely to get burned with so much hot metal about, as well as spoil the work. Boys are not suitable to be made putters up under the age of 14 or much over 16, as they are less handy if they begin older. Some however are not made putters up till they are older, even 18 or nearly grown up. They are usually apprenticed for six years at whatever age they are bound. With the overwork the takers in get 8*s*. a week, and the putters up 9*s*. A boy very seldom becomes a gatherer under the age of 18, but in rare cases they do. One became so at 13.

The work is healthy for the boys if their parents take good care of them at home, and see that they have plenty of sleep and food. If parents take good care of their children at home there is little fear but the children will get on well at their work.

Some time ago we built a school-room and provided books, &c. for the boys. The school time was fixed usually at about six hours or so after the end of a journey, so as to let them go home and refresh themselves and get some sleep. But they would not come, and after about 6 months the school had to be given up. After that, instruments were provided to form a band, and all that the workpeople were required to do was to pay their teacher; but that too fell through.

[The manager of the works, who was stated to be a man of long experience, was called in and referred to by Mr. C. Burron, to ensure the correctness of the details in the above statement.]

Dublin.

THE DUBLIN GLASS BOTTLE COMPANY'S WORKS, NORTH LOTS, DUBLIN.

211. *Mr. Campbell*, partner managing the business. —We make six journeys a week. Mondays we begin early, because the founders come on early on Sunday, say 3 p.m., other days we begin at 6 a.m. as near as may be. The working journey averages about 10 hours or from that to 11. Monday's journey is not longer than the others. Saturdays the hands leave at 4 p.m., and other days at about 6 p.m. We found in the night, and are able to do this pretty regularly, so as to begin in the morning. In bottle works in England and Scotland, as I have understood, the founding takes longer in consequence of their not having so good coal, and they make only five journeys a week. We do not require more than a working day of 12 hours, but it would be difficult to fix within an hour or two at what time the work could begin, owing to the uncertainty of founding. This may be delayed by the quality of the coal, the carelessness of the founders, the breaking of pots and like accidents. Pots may break either in the founding or in the

working, but more often in the founding from the greater heat. If a pot is not so much broken but what the metal can be saved, it is laded out, otherwise it is left till the journey is finished. We could reduce the uncertainty of beginning a journey to within an hour, *i.e.* so that it would not be later than 7 a.m.

For this however the furnaces must be in good order. When they get old and worn they take longer for founding, as they do not hold so much heat. A furnace is constantly wearing out, and requires to be renewed about every 12 months. This is in consequence of the more constant founding and greater heat in bottle houses. In flint-glass houses there is only one founding in a week.

Very few of the boys are under 13 years old, and I believe that most takers in are as much as 14 or 15. They are generally sons of some of the men. A boy would become a good taker in in six months, and do passably in one month. Wetting off is the lowest stage of work at which a boy is taken as apprentice. He takes the bottle from the blower, saucers it, *i.e.* puts it in a mould to indent the bottom, cuts the neck to the right length, and gives it to the finisher. Apprenticeship is for five years: it requires five years practice to become a finisher. If the men have any rule as to the number of apprentices who may be employed, we do not allow it to interfere with us.

The great mischief of this employment is the want of education. I have done what I can by speaking to the parents, and at one time we paid a subscription to the mechanics' institute to induce the boys to go to it, but they did not; so the subscription became thrown away, and we had to give it up.

212. *Mr. John Canning*, bottle-house manager.—Mondays the bottle makers begin at 5 a.m., and other days at 6. It is never much earlier, but may be one, two, or three hours later, on occasions much more. Men or boys go round and call the hands; some may have to be called twice, *e.g.* if they are sleepy from drink. All are in the habit of leaving by 6 p.m. Saturdays we leave by 4 p.m., no matter what consequence it might be to the master. That we consider our right, and it is so understood between master and men.

Some things make a difference to the time taken in founding. Coals differ. Some pots may take longer than others. Too much draught may make the metal boil too much, and then it is longer before it is fit for use, and not so good. Too little wind also may make the founding take longer; so may a contrary wind. We catch the wind on two sides only, say east and west. If therefore the wind is north or south it does not come in so well. It is true that this might be provided for by arranging so as to catch the wind on four sides, if people thought of such things in building a furnace. Neglect causes delay sometimes. Men cannot always be kept attentive, but of course this depends much on getting competent men and looking well after them.

213. *Michael Burne*, aged 11.—Taker in. Some Mondays we come at 2.30 and 3 a.m., but most times at 4 and start at 5 a.m., and leave at 5 p.m. Other days we come at about 6 a.m. and leave at about 6 p.m., always about the same time. If the metal is not all finished it is left in the pots.

It is the heat of the arch that swinged my hair on my forehead so; sometimes it swinges my clothes if the wind draws much.

Don't know the letters. Was at school a month and came away to go to work.

> [Of 10 other boys whom I examined, of ages from 11 to 16, three could read, write, and sum, three could read and write, one could "read middling," three could not read.]

The Ringsend Glass Bottle Company's Works, Dublin.

214. *Patrick Bowen*, age 14, drawer.—I am here going on this five years as drawer. Another boy and I draw the bottles from the arch; we have nothing else to do but clear out the cinders. We have a certain work to do every day, *i.e.*, to draw as much as six holes make. One hole makes on the average 90 dozen bottles in a journey, sometimes 120, sometimes only 60; 60 is the day's wages for a hole. Sometimes we take out 600 dozen in a day, often more. The bottles made on Monday are drawn on Wednesday and so on through the week. What is drawn on Monday has been in the oven two days. Am well accustomed to the heat, but would like to get another place if I could. Never got burned, thank God; it's very few that escapes it. When they are burned they have to stay away according to the badness of the burn. Gloves for us to hold the bottles with are given out from the office. Sometimes they are nearly worn out. We two come at 6 a.m., sometimes a little before, all through the year. We have three-quarters of an hour for breakfast, and the same for dinner. Get 5*s.* a week. The bottle makers work by journeys. It takes them about 10 hours to work out a pot.

We have no work on Sundays except of necessity, as if the wine merchants want the bottles of a Monday, and there is not time to get them out of a Saturday or on the Monday. We drew these arches last Saturday night. We had worked from Saturday morning as usual, went away and had supper, and came back at 8 p.m. and worked till 6 o'clock on Sunday morning.

> [An arch in use, into which I got was so hot as to cause difficulty of breathing. Another, in which a boy was, was hotter. One boy had his hand tied up on account of a burn. The bottles are grasped by the hand.]

215. *Thomas Brown*, age 10.—Taker in, here a year. On Monday always come at 2 a.m. to get the pipes and all the things ready for the men; they start working at 4 a.m., and finish at about 4 p.m. Other mornings we come usually at about 5 or 6, or as soon as the metal is plain, and leave work at about a quarter to 6 p.m., Tuesday, Wednesday, Thursday, and Friday, and Saturdays at 4 p.m. Are never called in the night, only Monday mornings. One of the night men calls us. We don't stop for no breakfast; Monday we bring it and eat it before we start at 4. Have about three-quarters of an hour for dinner, Mondays an hour. Don't get burned. That boy there gets burned, and has sore feet from his work. It is very hot. Never get beaten. Have 4*s.* a week wages besides the overwork, which may be 2*s.* or 3*s.*

> [The proprietors state that a "six pot furnace is always worked here," Cf. No. 210.]

216. *John Smith*, adult.—Teaser. All that work at founding the metal are men, three in the day and six in the night gang. I began bottle house work at nine years old; that is a usual age. The bottle makers begin working the metal when it is ready. That is at all hours, sometimes 4 a.m.; never knew it later than 10 a.m. Sometimes they stop three-quarters of an hour for dinner, sometimes not so much, sometimes more. They never work after 6 p.m. If the metal is not worked out then, they leave it in the pot and it is used up in the next journey; 60 dozen make the stated day's work. The weather makes no difference to the time taken in founding. It is all the coal. Sometimes we get bad coal, then it takes longer. If there is a high wind we only have to put more coal on, as it uses up more.

The Glass Manufacture.

Stained Glass.

Newcastle-on-Tyne.

Mr. J. E. White.

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MR. W. WAILES', STAINED GLASS MANUFACTURER, BATH LANE, NEWCASTLE-ON-TYNE.

217. *Mr. W. Wailes.*—My business consists in the production of ornamental designs in glass for windows. I do not make the glass, but get it from the ordinary glass houses, where it is made in different uniform colours. The patterns are formed here by arranging separate pieces of different colours, painting, shading, &c. I employ none but men, with the exception of a few boys of a superior class, all over the age of 13, who paint patterns, &c. The persons employed are of several different classes, the work of some being of an artistic and of others of a manufacturing kind. Their stated hours vary accordingly, but all is day work, and none longer than 12 hours with full stated mealtimes. It is only in rare instances that any overtime is made, perhaps for a few weeks before Christmas and Easter, but not more than one or two hours.

There is one point in connexion with this inquiry on which I feel very strongly indeed, and to which I especially wish to draw general attention, viz., the time of payment of wages. My practical experience for several years convinces me that no greater boon to the working classes could be devised, than if all manufacturers and employers could be pratically impressed with the importance of paying the wages at 1 o'clock, *i.e.*, just before dinner time, on Saturday. It is better than Friday night. If wages are paid late on Saturday afternoon or in an evening, a man naturally goes off to a beerhouse, and when he is once there money is soon wasted, and the wives come there late at night trying to get money to buy food and things with. But if a man gets his wages just before dinner time he must go home with them to get his dinner.

The stomach is an imperative thing, and says "dinner," and a man must go. When he thus gets all his wages home, and at a time when he is in a good humour, his wife easily gets the money, and in plenty of time to go into the market and to the shops. I used to pay my men at 4 on Saturday afternoon, and then men would only get away and drink. Ever since the change of the time of payment to the present hour, there has been a most marked change in their habits. There is infinitely less intemperance. My men are of a very high class, and very steady. I should say that more in proportion belong to benefit societies from this than from any other establishment here.

London.

MR. C. PRICE'S, GLASS BENDER, STAINER, AND EMBOSSER, CLERKENWELL GREEN, LONDON.

218. *Miss S. A. Price.*—I am sister of the proprietor. Glass bending is a separate trade. It consists in bending flat glass into curves for windows, lamps, &c. It is done by heating the glass in ovens and then shaping it, and is hot work. The usual day's work in the trade is from 7 a.m. till 7 p.m. with two hours for meals. It is men's work, but boys are apprenticed to it at 14. There is a boy here who helps the men by cleaning the glass and goes errands. There are only about nine persons in London who carry on the trade, and all on a small scale. This is about the principal place, and it is years since we had as many as six hands. Staining is done by painting the glass with the hand, and then burning the paint in. Embossing is forming patterns on the glass, eating off the surface with acid. It is men's work, as it requires skill. We now get ours done elsewhere.

MISCELLANEOUS EVIDENCE.

Treatment.

219. The statement of the next witness has already appeared mixed up with the evidence on another class of manufacture, into which I was making inquiry at the same time with a portion of the glass manufacture, and was left in its place there to save disarranging the type and numbering when the portion relating exclusively to glass was separated. I repeat it here that it may not escape notice from not appearing with the body of this evidence, and to avoid referring to the witness definitely by name. The place in which he worked was a flint-glass house in the Birmingham and Stourbridge district. The boy, when I saw him accidentally, *i.e.* having no previous knowledge of his employment or story, was seriously ill with heart disease following on two attacks of rheumatic fever, which had come upon him in the course of his employment, and was, by the account given to me, a gentle and well-behaved boy.

220. *Boy*, age 17.—The men are not very kind to you in a glass house; they are rough brutes there. They beat you with iron things, viz., the pinchers that they handle the work with, and the iron that they blow with, and hit you about the head with them, and kick and cuff and swear at you, and they will do this for such little things as, *e.g.*, if you tumble down and break a glass. We do not tell the master, they would beat us worse then. They are awful brutes and would do anything at you. I have seen them knock boys down and kick them terrible when on the ground, so as to make bruises on the body and legs. Once I was taking in a glass and fell down and broke it, and when I came back and told the master (workman) he jumped up and run at me and knocked me down and kicked me. There was a great bruise on my thigh from it. I saw a man hit a boy of about 12 on the back of his head with the blowing iron, which had some glass on the end of it, and cut his head open, and made it bleed. It did not bleed much. We all catched it sometimes. They leathered us sometimes. They leathered us sometimes because we did something on purpose for fun, and sometimes when we could not help it.

221. The next boy works in large flint-glass works in a town in the north of England, where his work is sometimes very hard and exhausting. He is a cheerful, strong-looking, and nice mannered boy, apparently not one who would complain needlessly.

222. *Boy*, age 13.—No, sir; they're not kind to you. You know you can't help spoiling two or three things, and if you do spoil one, they say nothing, but kick you. Sometimes a man says he'll give me a crack o' the lug, and hits me a skelp; we're forced to be skelped now and then. If you don't do just what they tell you they curse so. I have seen two or three boys knocked down. Some time ago a man hit a boy with the punty iron, but he was punished, and I have seen no one hit with an iron since. One Friday night the walking manager very nigh burned a boy. He struck the boy because he (the boy) tossed up a bit of rag, but he was brought up by the boy and fined 3*l.* He carries a belt to hit the boys with.

I did not come as apprentice, though others did. A boy who was "bun" (bound) was used so bad that my father would not let me be "bun." My gaffer now is very kind to me, and some of the men are very kind.

I was at school, but I was so pleased to get here before my schooling was done, viz., at 11 years old, and now I would be glad to get away. That is

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because when you spoil a few things you get called so, that you get sickened of the place. They call you very bad names and say naughty things, asking you what your father can do and what your mother can do, and saying everything bad, *e.g.*, they tell you to go to "the damned place." When they're in a passion they'll say anything or do anything to you, it's nothing to them. No one knows nothing before he comes into a glass-house, you know a vast before you go out. You soon learn things here. Boys think it would be so pleasant to come and get money, but it would be a vast better for them to stay at school.

Father says there was no place so bad as a glass-house, and that it is the same still. He was a glass-maker, and is now a small tradesman. He will not let me go a foot with the other boys here, so when I come out of the glass-house I have to go off by myself or get with boys who do other work.

I hope, Sir, there will be nothing wrong with me for having told you all this. You have asked me a great many questions, and I could not help telling you.

223. The next boy works in a bottle-glass house in a village in Yorkshire. His statement was made to me in the presence of the clergyman of this parish, who stated that the boy and the rest of the family might be relied upon for truthfulness. My first knowledge that the boy had met with any ill treatment was from his mother, whom I saw in her cottage, without any previous intimation, and I went upstairs to see the boy, who was ill in bed, without her.

224. *Boy*, age 15.—I am now ill in bed and in great pain, but till I was bad I worked in a bottle-glass house near here. The men are not kind at all. They use such bad language and curse at you so, that I have come home roaring for it at 1 o'clock in the night. One man for whom I worked was very bad. He has got me up in a corner and knocked me down, and kicked me as I lay, and I have had bruises from it all up my back. He would be like mad at you sometimes. I have been knocked about and kicked by him like this two or three times. Master told him that if he did it again he would give him the sack.

225. *Mother of last witness.*—I have had three sons in glass houses in this neighbourhood. They have been kindly treated by the men, except one, who worked in a bottle house. He has been knocked down and punched, *i.e.*, kicked. The men are so different; some have a deal of patience with the lads, who of course want much teaching before they can do their work properly. Some men are just the opposite. The boy is now ill in bed with bad pain, from gout and sciatica, I think, but I do not know whether it was caused by his work, or how. I think he has done with glass-house work now. He has a burn on his hand. He is only a wetter off, but he was learning to blow a little when work was over, and let the pipe drop, so he put his naked hand into the furnace and pulled the pipe out. It took the skin off his fingers.

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226. *Boy*, age 12.—Taker in in some bottle works (in a town in the north of England, not the town referred to in No. 221.—J. E. W.) The men are kind to you if you do your work right. If you do not, they will hit you a smack on the loof, and say, "That will learn you to do it right next time." If they are vexed at you, or you spoil the work, they will hit you with bessum shanks, what you sweep the coal with, or may be with the iron, and sometimes knock you down and kick you. Have seen four or five other boys served so. Have not been knocked down myself, but have been struck with the "double knife" so (clenching his fist). One man hit me over the head with the het (hot) pipe, but it did not burn me; I had my cap on. Sometimes they put the hot metal at you to frighten you. Boys many times have so run off from work because they are frightened of the men. Got my cheek burned very bad by running against one of the men. Was 10 when I came here.

227. The next boy works in some large bottle-glass works in a town in the north of England, the same as the town referred to in No. 221. The manager had expressed his belief that there was no ill-usage of boys now, though it had been known formerly, and he stated that if a man were known to illuse a boy he would be fined or dismissed.

228. *Boy*, age 14.—Taker-in. We are called about two hours before the men, and are usually here from 12 to 14 hours each journey. Like the work. The men are very kind to me that I work with now, and never strike me. There are different holes where they behave very bad to you. They are such disagreeable men, you can never please them. Sometimes they will fling bricks or anything that comes in the road at you. They do this sometimes if a boy has a bad foot or anything so that he cannot work so well. They think boys have no feeling. We wear slippers, for fear the hot metal might get into your feet. Have seen three boys knocked down by men. If the master knew it they would get the sack. Men often fling the iron at you, but only to frighten you, and they strike some of the boys just to frighten them.

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229. *Boy*, age 11.—Shovel holder in sheet glass works (in another part of England.—J. E. W.) since 8 or 9 years old. We gets hit very often, as, *e.g.*, if we are away for our victuals or anything. They hits us with the shut fist very often across the head. Have been knocked down two or three times, and have seen others what work with me knocked down. They kicks us too on our backside. Have been hurt so myself; and have seen a good two or three hurt by it so that they could not go on with their work. The big boys hits us too if we don't do just what they want.

[This boy is quick and cheerful, but suffers from his work.]

Treatment and Medical.

230. *Matthew Hinchliffe*, M.D., and M.R.C.S., Dewsbury.—I have been 20 years in practice. Some time ago, perhaps three or four years, I was called upon to examine medically some of the boys employed in the large bottle-glass works near here. Some boys who had been set to do some blowing usually done by men, in consequence, I believe, of some men being on strike, complained that the work was too much for them, and refused to continue it, and were therefore brought before the magistrates by their employers. Two medical gentlemen and myself were referred to for our opinion as to whether the work to which the boys were put was injurious to to them, and we gave our opinion that it was so, but another medical gentleman gave an opposite opinion. One of these boys was, I think as young as 14. The case against the boys, however, broke down on a legal point, viz. that they had not been formally apprenticed to their present employers, but only to the former master.

The disease usually supposed to be caused in

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reatment and Medical.

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blowers by the lungs being called so much into action, is emphysema, but I have not found that in any boys that have come under my observation. The action of blowing, if continued, must be very exhausting. Boys should not be allowed to do it at all while they are quite young, but I see no reason why they should not go into a glass house at work which does not involve any blowing as soon as they get habits of prudence enough to avoid danger. The mere heat in such works as these here is not enough to be a serious evil.

The loss of regular night sleep, however, which is involved in the glass house system of work, cannot but be injurious. Medical men find that from their own experience. They are shorter lived than men in other professions, such as clergymen or lawyers, and this is attributable to their wearing out from the want of regular sleep by night, not from want of a sufficient amount of sleep, as they generally make that up. It is not exposure to diseases in the course of their practice which shortens their life. Sleep by day is not so beneficial as sleep by night. The presence of day light tends to prevent sleep from being so deep. The night atmosphere also is considered to be more unwholesome than that of day.

A few weeks ago a boy of about 11 years old from the glass works was brought to me by his mother for surgical treatment. One of the men had thrown him down in the glass house and kicked him in the mouth. The kick had cut the lip completely through and knocked a tooth out. If the kick had been on the head the boy might have been killed. It was too bad a case to allow to go unpunished, so, before doing anything to the boy's mouth, I made him go at once, just as he was, to the police office to complain. Otherwise probably it might have been passed over. Boys do not like to complain and fear perhaps that it may get them into trouble. When the case was tried, an attempt was made to excuse the man, but he had to pay a good sum of money.

Cases of such ill-usage as this however, are, I should say, rare. I do not remember others. The bottle workers are not a violent set, though in other respects they are the lowest of the working class about here, both as to ignorance and morality. The colliers are decidedly of a better class and more respectable than the bottle workers. The latter get very large wages, but with their want of education these do more harm than good. The men perspire immensely and drink in proportion. Some have enormous scores for drink; I have heard of some having as much as 25*s.* scored up at a beerhouse for drink in a week. Other classes cannot get the money for so much drink if they wished it. Even boys get into the same habit of drinking. I have heard that mere apprentices will drink half a gallon in a day sometimes,—and that public house beer too. It must very injurious. The class, however, cannot help being very ignorant, as they begin work so young and their work comes at such irregular times.

231. The defence offered in the above case of assault when it came before the magistrate was, that the occurrence was an accident and arose out of some throwing of "slack" or small coal. The case was settled on the man paying the doctor's bill, the amount of the boy's wages while off work, and costs, amounting in all to upwards of 2*l.* 10*s.* The presiding magistrate, whom I saw, referred me to the published report of the case for a strong expression of his opinion against boys of that tender age being employed at night at all, unless absolutely necessary, it having come out in evidence that the boy had been in the works from 5 p.m. till 7 a.m. on the morning of the assault, and that boys of that age were in the habit of being so employed.

Medical.

232. *Adam Jessop*, M.R.C.S., and L.A.S. London, 1828 and 1829.—I have been in practice at Castleford for 26 years, from November 1829 to February 1856, and still reside there and act as consulting surgeon.

The first glass bottle house was begun in the adjoining village, Whitwood Mere in 1828, by six workman from the bottle works of Mr. Bower, of Hunslet, near Leeds.

The first bottle house, "now the Aire and Calder Glass Bottle Company," was built in Castleford in 1836 by myself and one of the partners from Whitwood Mere. In 1839 I ceased to be connected with the works, and introduced Mr. E. Breffit in my place.

Consequently I have had ample means of forming an opinion of the works and workmen generally.

There are now 23 bottle houses at work, 19 in Castleford, and 4 at Whitwood Mere.

The trade is greatly on the increase. Five new houses have been built within the last two years, and there is every reason to suppose it will be very much more extended.

The population has increased in Castleford and the immediate district from 2,000 to 10,000. And parents with young children from the agricultural districts are constantly coming here to obtain work from the glass houses for their children.

The boys begin to work very young, from 8 to 10 years old. In consequence of the extreme heat, and the length of time they are kept at work, say from 10 to 12 hours, they are stunted in their growth, pale faced, the muscles loose and flabby, and nearly in all cases (there is) great weakness of the knees and ankles joints, so much so that the knees press against each other. This, together with the weakness in the ankle joints gives the boys the appearance of being cripples.

I think the hours of working too long, the labour too great, and also too quick, more especially during the summer months, when each boy, that is the little takers in of bottles into the annealing arch, runs upon an average from 15 to 16 miles each journey of five, during the week. I have frequently seen the little fellows with blistered hands and feet, and scarcely able to hobble along.

The night work ought to be avoided as much as possible, as the situation is low and damp. The interior of the bottle houses must be most unhealthy when in one deleterious article alone, arsenic, it is found on calculation that about two tons each week are used in the whole of the works. The boys and men generally take their meals in the house, and one or two narrow escapes from arsenical poisoning have occurred from the food being dropped upon the floor while arsenic is put into the pots.

The men are not subject to any particular disease with the exception of rheumatism. Still few live to a long age, and they become old at 45. *Vegetation* is greatly affected, and more especially during the last few years. The average of deaths is somewhat frightful. But I will not presume to say whether we are poisoned by the noxious gasses given off by the glass works or the river, the main drain from Leeds, Bradford, Halifax, Huddersfield, &c., which is thrown down upon us at the confluence of the two rivers, which join upon us here, the Aire and Calder.

I am told that the regulations in the factories are good and work well. If so, I think that the glass works ought to be placed under the same restrictions, and from my knowledge of the works, I think that the employers would not suffer in a pecuniary point of view, and the boys would not be *discounted*, as they now are for many worthless parents.

To J. E. White, Esq.
5, New Square,
Lincoln's Inn, London.

Castleford, Yorkshire,
February 22nd, 1865.

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Medical.

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233. *Samuel Smith*, F.R.C.S., L.—Consulting surgeon to the Leeds General Infirmary, and to the Hospital for Women and Children; also Lecturer on Midwifery to the Leeds School of Medicine since 1831.

I was for 45 years acting surgeon to the Leeds General Infirmary. I have always given much attention to the question of the hours of labour as affecting the physical condition of the working class, and had made many observations on this point, even before the inquiries which led to the passing of the factory Act of 1833. In my evidence before Parliament at that time I stated that ten hours a day was the outside limit to which young growing persons ought to be employed in work of any kind; but my longer experience has convinced me that even ten hours is too long for many. Although the cases of factory deformity have been very materially diminished by the passing of the Act for diminishing the hours of labour in mills, still they very *frequently* come under my observation.

It is of great importance to the health of all persons, but particularly of the young and growing, that their periods for sleep and meals should be regular, *i.e.*, should be of proper length and taken as nearly as possible at uniform times in each period of twenty-four hours. To change these day by day must be very injurious to them. Their period of sleep should be in the natural time, viz., night, and the part before midnight is by far the most beneficial. No young person under the age of 15 or 16 should be allowed under any circumstances whatever to be employed between the hours of 12 at night and 6 a.m.

Free exposure of the body to day and sunlight, at least to growing persons, is as essential to their healthy condition as it is to that of flowers.

234. *Henry John Yeld*, M.D., M.R.C.S.Eng., L.S.A.—I am surgeon to the Sunderland Eye Infirmary, the Wear Glass Works, and to the Ayre's Quay, and Bridge Bottle Works. I have been in glass houses and seen the work carried on. The maladies which the persons employed in these works suffer from are but few, and during the three years that I have been surgeon to the Wear Crown and Sheet Glass Works, both men and boys have been very free from disease. Bronchial and other pulmonary affections are the diseases to which they are most liable, and this is owing in a great measure to the intense heat to which they are exposed, combined with the extreme draftiness of the houses, men in violent perspiration being constantly exposed to strong currents of cold air. The boys employed in bottle works suffer more than the former, as they are taught when very young to blow bottles, the effect of which is that they are sometimes attacked with spitting of blood and severe chest disease. The sulphurous vapour generated by the coke and coal is also injurious. Rheumatism and rheumatic fever is not so prevalent as one would have expected. Diarrhœa is at times very prevalent. The boys employed in the bottle works suffer very much from whitlows on their hands and fingers, and which they say arise from handling the hot pipes at the same time having their hands wet with water (not always the cleanest) to cool the handle. Burns sometimes occur, but in most instances they result from the person's own carelessness or that of a fellow-worker. Those employed in the bottle works are more liable to burns than those employed in the glass houses (*i.e.* crown and sheet, J.E.W.), as the former are obliged to work very closely together, and are constantly running in each others way.

The boys employed in both places are sallow and not very muscular. The former is probably attributable to the want of light and the latter to the heat.

Both men and boys as a rule get very good wages, and the majority of them live well. They are liable to be called to work at all hours, and thus seldom get the benefit of a regular nights rest, but the boys' work is not continuous, as they often have intervals of rest for an hour or two, which they generally spend in some kind of recreation.

I should say that the sheet and crown glass work was more healthy than bottle making, as I have many more patients in proportion from the latter class. In my opinion glass house work and bottle making is not suited for boys under 13 or 14 years of age.

235. *H. Rae*, L.F.P.S.—I am the medical attendant of the F Division of the Glasgow Police. There are several bottle and flint glass works in this neighbourhood in which I practise. I have been in works of both these kinds and am acquainted with the nature of the employments. In my opinion they are not healthy, and the appearance of many of the workers shows this. I do not attribute this to the fact of their working by night, but to the long hours and heavy nature of their work. The air too in bottle-houses is loaded with dust, and the bottle-house work is altogether heavier than that in flint-glass houses.

In both, the blowing, especially at an early age, is injurious. Its effect is to strain and weaken the lungs, and produce cough and difficulty of breathing. The changes of temperature from heat to cold may contribute to this. The injury is not of an inflammatory, but of a chronic kind. I do not know that youths begin to blow till about the age of 18, but at that age or soon after patients have come to me complaining of the effects which I have mentioned, and I have had to advise several to give up the work. If they go on they are liable to become asthmatical.

Blowing is not fit for boys at all; but if they do it, it should only be for a short time. An hour or an hour and a half is quite as much as a boy of 14 should blow in a day. No boys who are not physically and constitutionally strong should take to it. I have known many who have taken to it fall into ill health, which they might probably have escaped had they gone into other employments. It would be beneficial if before a boy entered a glass house, his physical fitness for the work were ascertained, as required in factories. I attend the cases of accident in a spinning factory employing about 1,200 persons, but the certifying surgeon for the district certifies. Boys are anxious to get into glass houses because of the good wages.

General.

236. The following general account of the glass manufacture in this kingdom is taken from a paper prepared by Mr. R. W. Swinburne, a large plate-glass manufacturer of Newcastle-on-Tyne and South Shields, and read at the last meeting of the British Association at the former town. As it contains much useful information not otherwise obtainable, I avail myself of his kind permission to me to make use of it.

Paper on "Glass," by Mr. R. W. Swinburne.

237. In preparing the following statement I have been much assisted by Messrs. Jas. Hartley and Co., of Sunderland; Messrs. Sowerby and Neville of Gateshead; Mr. Bowron, of Stockton; and Mr. Wailes, of Newcastle, (glass manufacturers.)

Newcastle-on-Tyne and the district immediately adjacent have long been celebrated for the manufacture of glass; and that kind used for architectural purposes, which may be considered the most important branch of the art, was first made in Great Britain within the precincts of this ancient borough. The manufacture, as carried on so long in this locality, consists of the

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following principal departments, viz., plate, crown, sheet, flint, and bottle glass.

PLATE GLASS.—The art of casting plate glass by throwing the molten material on an iron or copper table, and rolling into a sheet of equal thickness was first adopted in England, in Lancashire, in 1771; but there is abundant proof that plate glass of smaller dimensions was made before that time at South Shields, near this town, where is situated the only manufactory of plate glass in this district. Blown plate glass, which was the great original of the art in all countries, depended entirely in its manipulation on the strength of lung and dexterity of muscle of the individual operator, whose *chef d'œuvre* was about four feet long and 2½ feet wide, whereas the cast plate is made by the co-operative effort of 20 men, who move from the furnace the crucible in which the material is melted, and by means of powerful machinery roll it into a plane of any required demensions. Up to the year 1845, the return of the excise duty shows that there was more plate glass made at South Shields than at any other manufactory in the kingdom. In that year the excise duty on glass was abrogated, and in consequence the produce of this manufactory has been quadrupled. Previous to 1845, the quantity of unpolished plate glass blown and cast at South Shields was 312,000 feet per annum. Now its capability of produce is 1,240,000 feet per annum. A new kind of plate glass, called rolled plate, has been for some time manufactured at Sunderland, by the spirited firm of Messrs. Hartley and Co. The invention is due to Mr. James Hartley, who has had the honour of establishing a new branch of manufacture of great public utility. This new article somewhat resembles unpolished plate glass, but is lighter in substance, and eminently fitted for roofing and other purposes of construction where translucency only is required. It is made in two other places in the kingdom, but Messrs. Hartley and Co. alone produce 18,000 supercial feet per week, or nearly one million feet per annum, representing a value of near 15,000*l*.

CROWN GLASS.—Ordinary window glass was first used in Great Britain for architectural purposes at the great monasteries at Monkwearmouth, on the river Wear, and at Jarrow-on-the-Tyne. When the British Association first held their meeting in Newcastle-on-Tyne there were six large crown glass manufactories in operation on the river Tyne, producing annually upwards of seven millions of feet of window glass. These manufactories have now ceased to exist, owing chiefly to the introduction of sheet glass into this country, and the comparatively low price at which plate glass can be now be had. Crown glass is made in a circular shape, which, of course, involves a considerable loss of surface in being reduced to the rectangular shape in which all window glass is used, and the knob or "bullion" in the centre limits the size of the window panes. The public taste now demands panes of large dimensions, an object which is attained by the use of sheet glass; and although crown glass maintains the palm of greater brilliancy, yet it must be esteemed in the light of an effete manufacture, and will gradually die out in this country, as it has already done on the Continent. The manufacture of sheet glass has been at different times carried on to a small extent in the old crown window-glass works of the river Tyne, but it is now entirely abandoned, so that in the birth-place of the art in England there is now not a foot of crown or sheet window-glass manufactured. But in the progress of the arts we often see that one process is superseded by another. Crown window-glass is no longer made on the Tyne, and as an art it is declining everywhere, but the manufacture of sheet glass has of late years been most largely increased, and is carried on to a great extent in the adjoining district of the river Wear, where the quantity produced by Messrs. James Hartley and Co. alone is very nearly equal (to?) the entire produce of the six extinct crown glass manufactories on the river Tyne. To Mr. Chance, of Birmingham, and Mr. Hartley, of Sunderland, we are indebted for the introduction into this country of the manufacture of sheet glass, which may be said to have given a new feature to our public and private edifices. Made originally in a rectangular shape, it is more mechanically adapted for use than crown glass; and having no knob or "bullion" in the centre it supplies the desideratum of large panes at a low price. So great were the difficulties attending the introduction of this manufacture, that although the original experiments commenced in 1832, the manufacture was not fairly established until 1838. There are two manufactories of sheet (glass?) in this district, and their united produce is eight millions of superficial feet per annum, which, at a low rate of value, is worth 50,000*l*. The manufactory of Messrs. James Hartley and Co., of Sunderland, produces one-third of the sheet glass made in England. This article has long been manufactured on the Continent, but, owing to the vexatious restrictions of our excise laws, it could not be made here; and the gentlemen who introduced it into England were obliged to obtain an alteration of the laws in order to construct the proper furnaces for its manufacture. The abolition of the excise duty on glass, together with the numerous and most obstructive regulations which that impost involved, has had an effect beyond all anticipation in improving the glass trade in general (especially the crown, sheet, and plate), both in its manufacturing and commercial character; and most interesting details could be given of these results were this paper to embrace an entire exposition of the glass manufacture. The commercial improvement of the window-glass trade owes also a great deal to the abolition of the window duty,—a tax which was fraught with great evil to the community. Since this impost was removed windows have multiplied to an extent which cannot be appreciated, and, although the object of its abolition was the relief of the public, yet its incidental result has been to stimulate in no slight degree the window-glass trade of Great Britain.

FLINT GLASS, the "crystal" of the ancients, has been made in Newcastle and its neighbourhood for a very considerable period, but its early history in this locality is obscure. It is more than probable that its manufacture was first introduced here by Sir Robert Maunsell, who, as before remarked, established window-glass works in this borough in 1616. Originally made from triturated flint, that designation has been continued, although the flint of former days has long been superseded by silicious sand. The manufacture is divided into two branches, viz., blown and pressed; the first being produced exclusively by manual labour, and the latter chiefly by machinery. The blown flint glass retains its eminence for brilliancy in consequence of its facets being produced by elaborate polishing, whereas in pressed glass they are the result of pressure of a metallic mould on the plastic surface in a heated state. Owing to causes hereafter adverted to, the manufacture of blown flint glass has, in this neighbourhood, declined as much as 50 per cent., but the manufacture of pressed glass has recently been prosecuted with great vigour and success in this locality. One firm, which is at the head of this branch of trade, and formerly produced annually 350,000 lbs. weight of blown flint glass, now make of pressed glass about 3,000,500 lbs. weight. The annual produce of flint glass on the Tyne and Wear is estimated by competent authority at ten millions of pounds weight, the wholesale value of which, including its cutting and ornamentation, is about 200,000*l*. The manufacture of pressed glass has cheapened flint glass articles to such an extent that almost the poorest of the population may be supplied with elegant articles of domestic use, which, a few years ago, were far beyond their reach.

GLASS BOTTLES.—As in other branches of the glass manufacture, this district has been most eminent for the production of common glass bottles. The neighbourhood was deemed especially adapted for the manufacture of bottles, not only from the cheapness of fuel, but from the vicinity of an extensive fluvial deposit at Jarrow Slake (a part of the river Tyne dry

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at low water) which was long used as a material in the manufacture. Experience has long substituted more simple materials for this primitive compound, and it is found that bottles can be made wherever lime and sand are found, independently of this once highly esteemed deposit of nature. Since the repeal of the duty in 1845, the produce of common glass bottles has increased four-fold, but there are other causes that have materially contributed to this result. The rapid rise of Australia, and the increasing taste for bitter beer there, in India, and in most parts of the world, have created an immense demand for bottles. During the year 1862 there were 47 bottle houses in operation on the banks of the Tyne, the Wear, and the Tees, and their produce was about 4,230,000 dozen. There has been no important improvement in the manufacture of black bottles for the last twenty years, and in the manipulation there has been no change. The baneful union amongst the workmen forbids all attempts in that direction. The ancient process of fritting, at one time in use in the manufacture of window glass, continues to be used by the maker of black bottles, and no process has been adopted by which, as in other branches of the art, the component materials can be thrown at once into the crucible without heating in a preparatory furnace. A new manufacture of bottles has sprung into existence, and this district has taken a prominent part in it. A mixture, somewhat similar to that used in the crown and sheet glass process, is employed in making what are termed pale bottles, the colour of which is that of window glass. Besides being of a light colour, the skill of the manufacturer has given them every variety of tints by the interfusion of metallic colouring matter, and vessels of various, and in many cases of tasteful, design and colour are made in great abundance, and are in most extensive use. A firm at Blaydon, in this neighbourhood, has attained considerable eminence in this new branch of business; and there is no doubt that it furnishes a field of great improvement in the approximation of its products to the lucidity of flint glass without the use of the expensive metallic ingredients used in that manufacture. The beautiful art of coloured glass, or what is termed stained glass, has been carried on most successfully for some years in this borough by Mr. William Wailes and others; and the tasteful designs and beautiful colouring of Mr. Wailes' numerous works have given him a great celebrity throughout the kingdom. A great improvement has been made in this description of glass, inasmuch as exterior staining has been superseded by glass made of the required tint in the crucible of the manufacturer. The glass, therefore, is not stained, but is inherently of its peculiar colour. It is manufactured of any tint at the works of Messrs. James Hartley and Co., of Sunderland. This process of making coloured glass in the crucible has restored the art to its pristine state, for in such manner this glass was made by the old masters. By its means the brilliancy and durability of the old coloured glass has been obtained, and all the colours of antiquity are produced by our modern manufacturers in greater brilliancy, ruby alone excepted. In the production of this colour our manufacturers are gradually approaching the ancient standard. It is ascertained that there is something in the undulating and imperfect surface of the glass of the 14th century which renders it more adapted to display intensity of colour than the more perfect glass of modern times. Hence the coloured glass makers resort to the use of a glass as the basis of their colour which of itself is of the most rude and imperfect character.

A great impediment to the progress of glass manufacture in this district is the trades' union amongst the workmen. In the blown flint trade the union exercises a power which amounts to a domination over the employer. In one case at least a manufacturer permanently gave up his business from this cause, and in other cases large works have been for a time wholly suspended. At present the blown flint-glass makers can only obtain a workman by taking the first on the union-list, and must take the chance of his having the requisite qualifications, and must receive him with or without a character. The workmen in a window-glass factory on this river struck work because a non-union man had been employed in a subsidiary part of the process. They abandoned this work the moment the obnoxious man made his appearance, the materials on which they were operating, of the value of 300*l.*, were spoiled, and the works were a long time dormant. The relation of master and man in the blown flint and bottle trades amounts to a chronic strike. Labour in these trades is the great element of expense. The men regulate that expense by a dictation against which the master is helpless. This insensate oppression is derogatory to the intelligence of our time, and most seriously obstructive to our local commerce. Large orders have been transferred from the Tyne to Belgium, and the manufacturers here purchase foreign glass, for the production of which they have every appliance at home, except labour, at a reasonable cost. The success of the pressed glass manufacture is greatly to be attributed to its being independent of skilled workmen, its operations being chiefly carried on by machinery.

A respectable flint glass manufacturer makes the following statement:—"The glass makers' society "decides upon the number of apprentices the master "shall employ, and the rate of wages he must pay "his men. It also orders the allowance of what is "termed 'drink-money,' which is daily spent in the "purchase of intoxicating liquors. This induces "unsteadiness in the men, and in the majority results "in habitual inebriety. The apprentices and boys are "encouraged by precept and example to follow in "the same course, so that the evil is perpetuated. "The master is powerless to prevent intoxication, "for if the drink-money is withheld the whole of the "men strike work. The manufacturer is obliged to "provide the men a certain quantity of what is "termed 'metal,' *i. e.* molten materials to make into "goods; but if they cannot or will not work up all "this metal, the master has no redress; it must be "laded up at the crucibles as waste, and the employer "must give the men more drink for lading it." Thus these infatuated men, many of them endowed with great ability in their craft, impair their own efficiency by their sensuality, violate the first principles of political economy, and inflict upon the employer a burden which hopelessly fetters him in the race of competition and improvement.

Another impediment arises from the prohibitory duties imposed by foreign governments. The English makers of plate and window glass have represented to our Government that their cost of labour is 60 per cent. more than that of the foreign rivals, who are allowed to import their produce to this country duty free, whereas the Continental duties are prohibitory. In many articles the English manufacturer could compete with the foreign rival. He asks no protection, but desires equal terms with others, and he will take his chance in the competition. The English manufacturers of glass universally complain that our diplomatists negotiate treaties and settle tariffs without preconsultation with persons conversant with the trade; and they think that better terms might have been had if more information had been previously obtained.

The manufacturers of window glass on the river Tyne have originated so many improvements in the process that a brief allusion to them will be consistent with the object of this paper. * * * * The plate glass manufacturers on this river were the first to discontinue the process of double fusion of their materials, which had up to that time been melted in large crucibles, and then transferred to smaller for a second heating. The large crucibles have been abolished, with few exceptions, and one heating now answers perfectly well, to the great economy of the process. As regards glass processes generally, it cannot be denied that they present a great field for

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improvement. To those who study them in their scientific bearings, there appear many desiderata ; and it is to be hoped that the manufacturers engaged in this important branch of our national commerce will energetically pursue the improvement of an art which most materially promotes the physical comfort and intellectual taste of the people, which has brought the costly crystal of antiquity to the tables of the poor, and has given without stint the light of Heaven to the humblest of their habitations.

q.

238. Upon the reading of this paper, according to a published report of the proceedings,—

A local (glass bottle) manufacturer complained that, whilst all other branches of manufacture were progressing, the glass manufacturer stood in this position, that he was unable to introduce any improvement ; the workmen checking every effort at improvement. The rules by which the workmen governed themselves were such as rendered it impossible for the manufacturer to continue at the head of his own establishment, but he must obey those impulses given to him by the workmen. He had got the rules of a section of the "Glass Bottle Makers' "Union." He would not trouble that meeting by any detail of them ; but he was sure that gentlemen who were in the trade would bear him out in stating, that not only was the manufacturer controlled as to his mode of working, but that union dictated what each particular man should do. It also intimated that the apprentice might only learn certain branches of his trade ; and supposing he happened to acquire other branches, he was not allowed to practise them, and thus the progress of manufacture was impeded. The whole manufacture in this district was delicately poised as to competition with France and Belgium. In this locality they had hitherto had some advantages, owing to the abundance of cheap and good fuels ; but those who had listened to the able address of the President of this Association would have gathered from him that it had become a question of some anxiety how long those fuels would continue. If once they were to pay an increased price for those fuels, the position that this manufacture held in this district would, he was afraid, be doomed for ever. He was quite sure that the combinations of workmen as adapted to this particular trade were not only injurious to the manufacturer, but also to themselves. They were oppressive to the last degree. Workmen were not unanimous any more than any other class of the community. They did not all approve of those unions, but they must perforce become members of them. He would respectfully suggest that it was a subject that was well worthy the consideration of our legislators.

239. It is right to remark that I have seen a reply by a "glass-maker and trade unionist" controverting some of the above statements as to the objects pursued and the rules enforced by his own trade, viz., flint-glass blowers. A copy, however, of the "rules of the Flint-glass Makers Society of Great Britain and Ireland" as revised in the triennial conference held in London 15th to 19th June 1855, the latest copy which I have been able to procure, shows that at that date they were of a nature to make the mass of men practically dependent on the society for employment and greatly to interfere with the management of the business by a manufacturer. Some modifications were made at a conference of the men and the Midland Association of Glass Manufacturers in April 1859, and others may have been made since, but the general effect of the rules, according to the common complaint of masters, remains such as makes them dependent on the control of their men to such an extent as to be a serious hindrance and loss to the manufacturer. The matter is one of importance for present purposes, as manufacturers advance it as one of the difficulties which they would find in the event of their manufacture being subjected to any legislative restrictions.

Mr. F. D. Longe.

EVIDENCE ON THE GLASS MANUFACTURE, COLLECTED BY MR. F. D. LONGE.

Bottle Glass.

Leeds.

MESSRS. SCOTT AND CO.'S, GLASS BOTTLE WORKS, ACCOMMODATION ROAD, HUNSLET, LEEDS.

240. *Mr. J. Scott.*—We employ 70 hands. These consist of men and boys. There are no women among them. About 35 to 40 would be under 18 years of age. The youngest boys are employed in the warehouse ; their work is to pack bottles. There are four little boys thus employed who are under 13. They have nothing to do with the manufacturing processes. Our warehouse is opened at 6 o'clock and shut at 5½ in the evening. These boys have not worked after 5½ more than once in 12 months. ; they never have been employed all night. The boys employed in the glass houses work the same hours as the men. The week's work consists of five journeys of 10 hours each. The glass makers consist of two classes—(1) the founders, and (2) the blowers. The latter class consist of—(1) makers, (2) blowers, (3) gatherers, (4) breakers-off, and (5) takers-in. The "takers-in" are the youngest boys. The "breakers-off" the next youngest, and so on. The "takers-in" are generally 13 or 14 years of age. Their work is is to take up the glass bottles with a long iron rod and lay them in the annealing oven. When the oven is cold, the warehouse boys take the bottles out, and carry them to the warehouse.

241. *Walter Fothergill*, taker-in.—I don't know how old I am. I have worked here four years. I worked the first year in the warehouse. I have been "taker-in" for two years. I get 4*s.* a week. I think I am 14. I generally work nearly 12 hours at a time. We generally begin at 7, and get away at about 6 at night. I generally stop at 9 o'clock for breakfast, and at one o'clock for my dinner. I have never worked through the day without stopping for dinner.

242. *Samuel Smith*, warehouse boy. I am going 12. I have only worked here since last Tuesday (about a week). I begin to work at 6 o'clock and give over at 5½. On Saturdays I leave at 5 o'clock. Before I came here I worked in a nail shop. My hours then were from 6 to 6, and on Saturdays we gave over at 2 o'clock. I never worked after 6 o'clock. I worked one year there. I never went to school. I got 3*s.* a week. I have two brothers and one sister. All work. I have no father. Mother does not work. I am the youngest.

Castleford.

MESSRS. BREFFITT AND CO.'S, GLASS BOTTLE WORKS, CASTLEFORD, YORKSHIRE.

243. *Mr. Russell*, partner in the firm.—There are five persons to each hole in the glass furnace. The "breakers off," and the "takers-in" are boys of 10 to 14 years of age. The "gatherers" are apprentices taken from the others at 14 years of age. We have also a few young boys in the warehouse employed in carrying and packing bottles. The blowers begin to work at about 3 o'clock on Monday morning, and

The Glass Manufacture.

Bottle Glass.

Castleford.

Mr. F. D. Longe

q.

finish their journey in from eight to ten hours. The journey generally commences about two hours later every day, so that the fifth journey is generally concluded at midnight on Friday or early on the Saturday morning. The boys in the warehouse begin at 8 in the morning during the winter months, and give over at 5½. In the summer they work from 6 a.m. to 6 p.m. All the boys in the works are hired and paid by us. There are 60 boys in the glass houses and 12 boys in the warehouse. All our apprentices are bound. The boys employed as "takers-in" and "breakers-off" for the most part follow the trade. We should never take a boy as an apprentice before he learnt both "taking-in" and "breaking-off." They are generally bound when they are working as "breakers off." The journey is ten hours, including stoppages for meals. The meals are not taken at regular times quite. A journey sometimes takes 11 hours, but that would be caused by some interruption in the work. There never is work for more than ten hours at a time; whenever the men take more than this time, it is because they cannot for some reason or other work the metal continuously. A journeyman glass maker gets 27*s.* a week. The youngest boys employed, viz., three of 10 and 11 years of age get 5*s.* and 6*s.* a week. These wages are high because it is such hot and hard work they have to do.

244. *George Barnes.*—Taker-in. I am going 11. I have worked here six months. I "take in." I began to work this morning at half-past 5. I expect to give over at half-past 3. I get my breakfast at half-past 8. I always stop half an hour for breakfast. I get my dinner at 12 o'clock. I stop three-quarters of an hour for dinner. On Friday we do not begin to work till after dinner. We give over at 2 o'clock on Saturday morning. I once worked for 12 hours and a half. We generally work for about 11 hours. I can't read. I have been to school. I have never been ill since I have been here. I have never had a bad cold. I have never staid away from work.

MR. EBENEZER WALKER KEMP, SURGEON, CASTLEFORD.

245. I have practised here as a medical man for eight years, and have had considerable experience as to the physical condition of the young persons employed in the potteries and glass works in the place. I am decidedly of opinion that the health and constitutions of the boys employed in the glass bottle works particularly are seriously affected by their employment. I should attribute the evil effects I have noticed to their being worked too young, to the injurious character of their work, and to their being employed for too many hours at a time. The evil effects I speak of are shown by a general exhaustion of the physical powers of the system. I have in several cases recommended lads to give up the trade, and many have had to do so. I have one case now of a boy of 11 years of age, who is suffering from the exhaustion of his system, brought on, I consider, by his work in a glass bottle house, although he was only four months at work. He was not a delicate boy when he went there. I have another case now of a lad of 18 who is also suffering in the same way, and from a similar cause. I do not think that the boys employed in the potteries suffer so much as those in the glass works.

TUTBURY GLASS COMPANY'S WORKS, TUTBURY, STAFFORDSHIRE.

Cut Glass.

Tutbury.

246. *Mr. J. Jones,* manager.—Our principal manufacture is cut glass. The only department in which young children are employed is the blowing department. In the cutting shop boys begin at about 14 years of age. They are taken as apprentices. All are bound by deed for seven years. In the roughing shop there are a few young women employed. In the grinding and roughing shops the hours of work are from 6 a.m. to half-past 6 p.m. On Saturdays they leave off at 2 o'clock in the summer. In the winter they work from half-past 6 to 7. They have half an hour for breakfast, an hour for dinner, and half an hour for tea. There is never any overtime in the roughing shop. The cutters work overtime sometimes. They never work more than a week at a time to 9. In the blowing house the hands change every six hours. One set work from 7 a.m. to 1 p.m. and then from 7 p.m. to 1 a.m. The change of hands takes place regularly. There are always two sets going. On Monday work begins at 7. They seldom work after 1 o'clock p.m. on Friday.

247. ROUGHING SHOP.—*Julia Barker.*—I am 18. I have not worked eight months. Before I come here I was at home. I come at 6 o'clock; I leave at 4. In winter I worked to 7 o'clock. I began at half-past 6 in the morning. I never get any grit in my mouth. I am paid by the quantity of work I do.

248. GRINDING SHOP.— *Charles Vaughan,* apprentice glass cutter.—I have been apprenticed two years and four months. Before I was apprenticed I went to school. I can read and write. I come at half-past 6 and leave at 7 o'clock in the evening. I have worked to 9. I never worked three days running to 9. I often work to a quarter before 8. That is overtime. We have to work this week to a quarter to 8. I get 4*s.* a week regular wage, and may earn what I can over that.

249. BLOWING HOUSE.—*Thomas Watson.*—I am 12 years old. I take in. I have worked a year and a half. I took in when I first came. I came at 1 o'clock last night and worked to 7 this morning, and then came again at 1 o'clock this afternoon. On Friday I usually stop at 7 o'clock on Friday night. I don't work on Saturday. I can read and write.

250. *Thomas Meer.* — I am 11 years old. I have worked two months. Before I come I worked in the cotton mill. I was a half-timer then.

251. *Rupert Meer.* — I am going 12. I have worked here more than a year. I can't read. I get 1*s.* a day. I take in.

Lancashire Glass Works.

Mr.H.W.Lord.

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LANCASHIRE GLASS WORKS.

Gentlemen,

1. I have collected evidence of the employment of children and young persons in glass-works at Manchester, Warrington, St. Helen's, and Leigh. In one or other of such works the various kinds known respectively as plate, crown, sheet, flint, and black bottle glass are produced, all more or less with the aid of juvenile labour.

Age.

2. Boys generally begin at flint-glass works soon after they are 10 years old. A young man, who had himself begun at 8, told me that it was rare at the present time for any to begin so young. Girls are seldom employed in flint-glass works before 11. In plate-glass works they do not usually begin before 12 years of age, and the boys rarely before 13. Boys in crown and sheet glass works begin at 10, but some told me that they were only 9 years old when they first came. I found at a bottle-glass manufactory one aged 9, who had begun before 8 years of age.

Sex.

3. Girls and women are very generally employed, except in bottle and crown glass works. In two plate-glass works where 1,044 persons are employed, 296 are females, four of whom only are under 13, and 88 between 13 and 18. In four flint-glass works from which I have had returns, out of 1,042 persons 126 were females, 11 being under 13, and 50 between 13 and 18.

Number.

4. In the four flint-glass works above mentioned, the total number of children is 114; of young persons 264; and of adults 664; so that more than one-third of the whole—378 in 1,042—are persons under 18 years old.

5. The number of plate-glass works in the whole kingdom is only six, and three of these are at St. Helen's (No. 29). From two of them I received returns, which show that only 12 children and 209 young persons are employed in them. In this case, therefore, not much more than one-fifth—221 in 1,044—are under 18.

6. At Messrs. Pilkington's crown and sheet glass works, as many as 132 boys are under 13, and 134 lads between 13 and 18. Of the females in their employment I have not any accurate returns; more than 150 are employed in occupations similar to those of females in plate-glass works, but not on the same premises as the crown and sheet glass works, nor in any process incidental to that manufacture.

Hiring.

7. The younger lads and the females are generally hired from week to week, and paid by their employers, in most cases by the piece. The older lads are apprenticed in the glass-making "houses," and in the cutting shops. Some indentures bind the apprentice to work for two or three turns (of six hours each) consecutively if required, but this is rarely if ever insisted on. In plate-glass works the younger girls called "colts" are not in the employ or pay of the principal, but are brought by the older ones to help them, in most cases being sisters or daughters of the women whom they help.

Wages.

8. In flint-glass houses the system of payment is a mixture of piece work and day work, whatever is produced in the week beyond a fixed amount being paid for by the piece. Boys under this system earn from 3*s.* to 6*s.* or 7*s.*, 4*s.* 6*d.* being commonly received for their week's wages. Girls of 16 or 17, at St. Helen's, earn about 15*s.* in the fortnight at cutting, and 15*s.* a week at flatting.

9. The drawers in bottle works earn about 2*s.* 6*d.*, the takers-in and wetters-off 6*s.* a week. In crown and sheet glass works the youngest boys earn from 3*s.* to 4*s.* 6*d.* weekly, older ones 6*s.* to 8*s.* The smoothers in plate-glass works earn on the average 14*s.* or 16*s.* a week between two; the division of that amount depending on the relative ages of the pair; a good "colt" soon earns 4*s.* or 5*s.* a week.

State of place of work.

10. The "houses," which contain the furnaces, and where the glass is made or blown, are all airy. The heat at the mouth of the furnaces is very great, but there is no want of ventilation. The flint-glass cutting shops are often close, crowded, and sloppy. In smoothing plate glass much water is necessarily slopped about, but all the premises at such works are large and airy.

Nature of employment.

1. Flint glass.

11. In the flint-glass making houses the work is done in sets or "chairs." There are four persons in a "chair," three men and a boy; the latter carries the pipe with the molten glass in its first stage to the foot-blower from the furnace, and takes the glass, when finished, to the oven to anneal, whence his name of "taker in." The "foot-blower," who is frequently a lad of 17 or so, "gathers" the glass from the pot on to the end of the pipe, until sufficient is accumulated, and then rolls it on the polished steel table called a "marver," to take out the air-blisters, and to solidify the lump and make it of even thickness. He has his name from making the foot of wine glasses, goblets, decanters, and such things. The third, or "servitor," then blows the glass into the requisite size, using compasses, and the kind of pincers called "calopers," to give it an approximate shape, which the chairman afterwards brings to perfection.

12. When the glass is pressed into shape, by being blown in a mould, the chair consists of six; three men, the gatherer, the presser, and the chairman; and three boys, one taker-in and two "stickers-up"; these latter have to be continually carrying off the pressed glass to another part of the house, where they hold or "stick" it up to heat in the fire, so as to melt and round the rim, which the mould leaves rough.

13. In both cases the boys are necessary adjuncts to the men, whose work would be at a stand-still, if the boys were not continually waiting upon and assisting them. (Nos. 1, 8.)

14. "Flatters" in flint-glass works hold the tumblers and such things on the side of a grindstone, which revolves horizontally, to smooth the bottom of them. These are among the youngest of any. The flint-glass cutter stands at a wheel over a trough, and presses the glass he is cutting against the edge of the wheel, under a small stream of sand and water, which drips from a funnel above it. Glass is sometimes frosted by similar means, but generally by the hand with a file, or a bar of glass, and sand. The cutters' wheel and flatters' stone are moved by steam power.

2. Crown and sheet glass.

15. Sheet glass is blown as flint glass is; but the blower's pipe, which holds the glass, is swung round at arm's length to elongate the glass; the lower end is next cut open, and the whole assumes a cylindrical form. The cylinder is then "split," or cut vertically from top to bottom, and on being laid in the oven the two edges separate, and fall over gradually so as to make the flat sheet. In making crown glass the pipe is worked rapidly round and round between the hands, until the opened globe, expanding by degrees, becomes a circular flat surface.

Lancashire Glass Works

Mr.H.W.Lor

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16. In crown and sheet glass houses the younger boys assist in various ways, some hold the "shovel" to shield the "gatherer" from the heat of the furnace; others of 11 and 12, "pushers," push the glass in and out of the furnace, or lift the cylinders, for the flatteners; others pour water to cool the blower's pipe, and carry the pipe to the furnace, and back, with some heated metal; this is a part of a block-minder's work, the whole of which is excellently described by one of the boys himself. (No. 38.) Others carry the cylinders of glass after they have been split, to be laid in the oven for flattening into sheets. In the warehouses boys cut the sheets (or discs of crown glass) into squares.

3. Plate glass

17. Plate glass is both ground and polished by machinery; in the former case lads scatter sand and water on the face of the plate, which is fixed in a stone bench; the bench is either made to revolve or stationary; in both cases a massive iron slab, or "runner," works over the surface of the glass. The boy at the polishing machine has to put some moist red material, consisting chiefly of burnt copperas. on the plate while the soft rubbers of the machine are polishing it.

18. The lads who help the men in the casting halls of plate-glass works are all strong lads of 16 or more. The glass is poured from the pots on tables and rolled under immense rollers.

19. Women and girls are employed not only in frosting and cutting flint glass, but, in plate-glass works, in "smoothing" the plates. This they do by the hand, pushing one plate of glass from side to side upon another, with emery and water between the two faces. The lower plate, which is the one to be polished, and is much larger than the other, is set with cement in the top of a stone "bench," or table. When the plates are very large, they have to kneel on the middle of the bench; in other cases they can reach as they stand at the side. It is called very hard work. The knees, too, are often much wetted. (Nos. 30, 33.)

4. Bottle glas

20. The youngest boys in bottle-glass works "draw" or take the bottles out of the drying kiln; for this purpose they have to enter the kilns, but not before they are tolerably cool; the bottles are, however, still hot enough at times to burn their fingers. (No. 48.) The employment of the rest consists chiefly in "taking in" and in "wetting off," and is similar to what has been already described.

Hours of wor

1. In making the glass.

21. In the flint-glass making houses, where the pots are repeatedly fed (No. 26), it is usual to work in "journeys" of six hours duration from Monday morning till Friday or Saturday morning, there being two sets who follow one another. A boy will occasionally work on for three turns consecutively, or 18 hours, to supply the place of an absent one. (Nos. 1, 8.)

22. In crown, plate, and sheet glass houses the custom is to work out the contents of the pot at one time, and then refill. The hours, therefore, depend on the speed of the workmen, the heat of the furnaces, and other causes, but ordinarily the week's work in crown and sheet houses is made up of four journeys, beginning at various times from 8 or 10 p.m. on Sunday to 6 a.m. on Monday (Nos. 36, 45), and lasting for 10 or 12 hours, with a break of about 30 hours between each, the hours for the boys being always longer, by two or three hours in some cases, than those of the men, as they have to sweep up, &c. (Nos. 39, 45.) In the plate-casting halls they work in alternate night and day sets, but at no fixed times, the secret of casting always at one time being "yet to be learnt in England." (No. 29.)

23. In bottle houses also the system is to work five journeys of 10 to 12 hours, with intervals of from 16 to 18 hours, beginning at about 2 a.m. on Monday. "The young ones get very tired when they are "long about, and some of them come two miles to work." (No. 48.)

2. In finishin &c.

24. In nearly all operations subsequent to that of making the glass, whatever be the nature of the production or process, the usual hours are from 6 a.m. to 6 or 5.30 p.m. These are, however, in flint-glass works, not unfrequently exceeded by the "flatting" boys, the frosting girls, and the cutters. Girls employed in cutting at St. Helens had been working during six weeks or more before my visit from 6 a.m. to 9 p.m. "as often as not." (Nos. 16, 23.) In Manchester the flatters "ordinarily make "overtime twice in the year, and from two to three months each time." (No. 2.) One boy of 13 had been flatting for more than a fortnight from 6 a.m. to 10 p.m. on Tuesdays, Wednesdays, and Thursdays. (No. 4.) Another of 14 worked from 6 a.m. to 10 p.m. for three days, and to 8.30 p.m. for the other two. (No. 5.) So an apprentice of 15, who was "punting" or rounding the bottoms of scent bottles, had been making 14½ hours a week overtime for three weeks, and said he "got very tired, indeed." (No. 6.) A girl of 14, who had been frosting from 6 a.m. to 10 p.m. for a month, and said that all the girls in her room, but the learners, had, added that she was very tired by 10 at night. (No. 7.)

25. In sheet-glass works the boys, who push for the flatteners, have no fixed hours, but work irregularly, at one time for 8 hours on and off, at another time for 12 hours, but between 8 a.m. and 8 p.m., or 8 p.m. and 8 a.m., working a double shift at the end of each week so as to give the night set of one week the day turn in the next. They had been working from 8 p.m. on Sunday to 9 a.m. on the Monday on which I visited Messrs. Pilkingtons' works. The schoolmaster there informed me that they were often very tired after a long turn, and went fast asleep at their desks, for they came straight from work to school. (No. 36.)

26. In plate-glass works the hours are limited by an arrangement in the trade to 66 in the week (No. 29), and it appears a rare thing for the smoothers, whether boys or girls, to work longer than from 6 a.m. to 7 p.m.; "not once a month till 8 p.m." (Nos. 30, 33.) A boy of 13 had stopped once only in seven months till 9 p.m. (No. 32.)

Night work.

27. In all those departments of glass manufacture, in which the "metal" is worked in a fused state direct from the furnace, night work exists to some extent. In flint-glass making lads of the two sets work for six hours of the night invariably for four or five nights. In crown-glass making at least two of the journeys may be called night work, for they ordinarily occupy most of Sunday night and Tuesday night. In the plate-casting hall they work in night and day sets, generally for less than the 12 hours in each turn. In cases of a break-down also the polishers have had to work by relays night and day. (No. 29.)

Meal hours.

28. In flint-glass making about half an hour in the six is taken for meals, which they eat on the spot. In the "journeys" in crown and sheet glass making there is generally a break of half an hour to feed the furnace, during which the workmen and boys take a meal. The machinery used in polishing and in grinding does not stop for meals. In the latter case, however, the younger boys have generally more than an hour's rest after every five hours, while a subsequent grinding goes on, in which they are not occupied.

Holidays.

29. The holidays usually observed in the district of the works are generally taken.

reatment.

30. There is considerable roughness in the treatment of the boys in the glass-making houses. "A deal "of cursing and swearing and knocking down, which didn't do any body much good; the boys often "deserved it, and weren't beat much, perhaps, but they are better without it." (No. 45.)

ccidents.

31. Accidents are very rare. The only one I heard of is that which happened to a boy at a polishing machine (see Nos. 37, 42), who was caught in the cog wheels and lost his arm. The pushers' hands are often cut by the glass. (No. 38.) Burns are not so frequent as might be expected.

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mployment
n physical
ondition.

32. Beyond the evil results of the intemperate habits, for which the great heat of the furnaces is undeservedly made responsible, no ill effects upon the health are traceable to the nature of the work in the "houses." Cutters suffer, it is said, from colic, through using putty powder; to this cause also the drop-wrist, which is not unfrequent among them, is attributed by some; others consider it to be the combined result of the position, in which the hands are held over the wheel, and of the continual dropping of the water over them. (Nos. 2, 28, 46.) Where girls work as cutters, "most of them get wet "through before the end of the day." (No. 16.) The standing and leaning forward over the breast-board towards the wheel is also very tiring. (Nos. 6, 21.) The grinders and the smoothers in plate-glass works get very wet, especially the latter, when they have to kneel on the plate. (No. 33.) A girl of 15½ called it very hard work, but said that no harm came of the wetting. (No. 30.) These seemed remarkably fine healthy girls.

33. Arsenic is sometimes used as a flux, but in small quantities, and not in such a way as to reach the younger hands. (No. 45.) The burnt copperas (sesqui-oxide of iron) is said to "get into" the men and boys who work at the polishing machines, but to be otherwise innocuous. (Nos, 30, 36.

Moral condi-
ion.

34. According to the account given me by a foreman and others at St. Helen's, the moral state of the operatives in flint-glass works there is very low, whatever their age or sex. "Most of their "conversation" (says one witness, speaking of the girls) "is horrid to listen to; some curse and swear "like troopers; not a few have had several illegitimate children;" and of the lads and men in the glass house he gives no better character. (Nos. 16, 27.) I found myself girls of 17, who had never been to school, and were utterly unable to read. Even at the Ravenhead plate-glass works, which form a small colony of themselves, under the eye of managers resident on the premises, who take the greatest interest in the welfare of their hands, it was considered necessary to make school attendance of the children compulsory on the parents. To the evidence of those gentlemen, and of Mr. Johnson, the master of Messrs. Pilkingtons' school, at which 260 of their lads attend as regularly as they can, I beg to refer you on this subject. (Nos. 29, 36.) Mr. Johnson states that, when he first came to Messrs. Pilkingtons' school, only one year before my visit, he found 80 boys who could not read. There are, however, in St. Helen's, those who, looking back on a state of things 20 years distant, can bear testimony to the social advance of men and boys.

Education.

35. In the Manchester works the girls have a good character (No. 1), and a great improvement in the conduct, especially in the language, of the boys, is recognized. (No. 8.) At the same time, in respect of education, there is both there and in the Warrington glass works still very much to be desired.

36. It is among the flatting boys that the grossest ignorance prevails. Boys of 12 even in Manchester not only could not read, but never heard of London; could not say what county Manchester was in; did not know who the Apostles were, and had never heard of the Acts of the Apostles. Many of them, and of the boys in the "houses," could only read words of three letters, and not even those with ease.

Legislative
restrictions.

37. The question of legislative restrictions on the hours of labour in flint-glass works was discussed by me at great length both with Mr. S. Bishop, of St. Helen's, and Mr. Webb, of Manchester, to whose evidence I refer you for their opinions (Nos. 1, 15.)

38. I see no reason why the half-time system should not be applied in the case of such works. The habit of each set working for six hours at a time affords an excellent opportunity for adopting it in the glass-making houses, in which the difference between two boys "is very trifling in general," even though one be a stranger and the other accustomed to the work. (No. 8). It is equally applicable to the flatting boys, who "are easily taught their work," and whose machines are inexpensive (No. 1.), and to the girls, whose "frosting" is hand work of a very simple character. The "drawers-out" in black-bottle works might be included; but in the making "houses" at those works, and in crown and sheet glass works, the inevitable uncertainty of the time required both for melting and for working out the metal renders an extension of that system to them impossible. That their work does, however, admit of an attendance at school for at least three times a week, and in most cases with tolerable regularity, is shown by the actual practice both at Messrs. Pilkingtons', where the school is attached to the premises, and at Messrs. Stocks', where parochial and other schools afford the ordinary opportunities. (Nos. 36, 45.)

39. There seems no reason why the hours for all, who do what is called day-work, should not be limited to those between 6 a.m. and 6 p.m., whether they be at flint-glass works or at any other kind. Mr. Webb expressly states that in his opinion the inconvenience would be trivial in flint-glass works, and it is there alone that overtime is ever worked to any serious extent. (No. 1.) The uncertainty, to which I have already alluded, would make it necessary not to fix the hours in the making houses, and as, from all I could learn, the 12 hours are never exceeded, and rarely attained in them, it would seem that no evil would result from such a course, seeing that night-work, to some extent, is from the nature of the operations in glass-making wholly unavoidable.

40. The question of requiring a certificate of ability to read and write as a condition of employment under a certain age is adverted to in Mr. Bishop's evidence at some length. (No. 15.) In my report on metal manufactures in Lancashire, I have already referred to the very general desire for some such measure. (3rd Rep., p. 181, c. 174.)

I have the honour, &c.
H. W. Lord,
Assistant Commissioner.

Lancashire Glass Works.

Mr. H. W. Lord.

r.

LANCASHIRE GLASS WORKS.—EVIDENCE.

Nov.–Dec. 1862, and July 1863.

FLINT GLASS MANUFACTURERS.

MANCHESTER.

Messrs. Molineux, Webb, and Co.

1. *Mr. Webb.*—I am one of the firm of Molineux, Webb, and Co. There are between 50 and 60 flint glass manufacturers in the kingdom. Messrs. Percival and Yates and ourselves are the largest producers of glass of the best quality in this town, or elsewhere, I believe, with the exception of Messrs. Sowerby and Nevill's, perhaps, at Newcastle.

We employ 311 persons, of whom 20 boys and 11 girls are under 13, the youngest being 10 years and 2 months, and the rest over 11; there are 65 lads and 25 girls between 13 and 18, and 8 women over 18.

I am sure that there would be no objection on the part of employers generally in our business to reasonable regulation of the hours of labour, particularly with the view of ensuring the education of the younger hands; that is most important, and all manufacturers would contrive to aid any scheme for that purpose so far as they could.

I think they should be made to go to school on the Friday and Saturday. Not 10 per cent. of the flint-glass workers in all England, I should say, work after 7 a.m. on Friday, and not one per cent. after 1 p.m. If they worked late on Friday, the metal would not be fluxed in time on the succeeding Monday. They start in the glass-house at 7 a.m. on Monday, and work in alternate shifts or sets, six hours on and six off, until the Friday; in some places, Newcastle for instance, I believe they work in eight-hour turns, which is in many respects better than six; it divides the night work better, taking the whole week through. As it is with us, most of them do not get more than 4½ hours sleep, and that is, for the young ones at all events, too little. The work, however, is not laborious; the men never leave exhausted. The houses. where the blowing is carried on, are lofty and very airy, and they have not, men or boys, to encounter any excessive furnace heat, as an ordinary thing, in the regular course of work.

They are all paid by the piece, that is to say, so much fixed wage for a given quantity, which we expect, and so much more, divided among the set, for production beyond that quantity in the time allowed for it. Here is a man, for instance, whose ostensible wage for the 48 hours is 23*s.*, but he draws 2*l.* 6*s.*; so the boys' wage is 3*s.*, but they will draw 4*s.* 6*d.*, 5*s.* 6*d.*, and 6*s.*; here is one who last week drew 7*s.* 10*d.* There are a number of lads always hanging about on the look out for employment.

The absence of one boy would leave the whole set idle, if his place were not supplied, and so four or five men would be rendered useless, and be earning nothing. The "taker in" is essential, because the annealing cannot be delayed, or the glass would break at once, and it is that, for which he "takes in." Sometimes one boy will take the turn of another who is absent, and so work on for 18 hours at a stretch; that is quite voluntary; he does it to please himself. We have a clause in our apprentices' indentures that they shall work one or two turns over, if it be needed, but we have never had occasion to avail ourselves of it.

In the other departments of the business, the frosting, flatting, and cutting, they are liable to overtime through the requirements of trade at certain seasons, chiefly those of Christmas time. For 14 days past we have been working some of them from 6 a.m to 10 p.m. We are going to get more hands next Monday in order to prevent the continuance of such long hours. We do not like overtime, it is very costly to ourselves; the wage alone is 18 per cent. upon the ordinary working hours, for our week for day-workers is 58½ hours, and we pay the same for 48 hours overtime as for a week's work, and for a less time in proportion, by the hour in either case.

Flatters are easily taught their work, and the expense of their machines is so slight that we may as well have some more in, and spread the work. The girls are all engaged in frosting; that is done by the hand, with sand and a file, or a bar of glass. They are all by themselves, and are a very decent and respectable class of operatives, very superior to the factory hands in this neighbourhood. We have been here 30 years and have never had one of them go wrong.

Our usual hours are 6 to 6, and on Saturday they leave at 12.30; breakfast is from 8½ to 9, and dinner from 1 to 2, for the day workers; all but those in the glass-houses, that is; there they have half an hour generally in each turn of six hours for a meal, which they take, as they are, in the house; the others go home.

It sometimes happens that they are late on the Friday in the glass-houses, so they get behindhand in the flatting, for that will throw us late in beginning the next week, since the metal will be later fluxed, and consequently the flatters will have no work at first, and have to make that up.

I have doubts about the success of working relays on the factory principle in our business; having, that is, two sets of boys for each "set;" the result would probably be a continuous tyranny over the worse boy of the two, if he were slower or otherwise less useful to the men in his set than the other: besides that, as we work, one of the boys would always have to be on for the night turn; they might, however, it is true, change week and week about; after all perhaps it might do, if they could be got to come for half their present earnings.

As to the restriction, upon the hours of young persons' labour, there would be but a very trivial inconvenience from that, and at the worst we should only have to get more hands. If all, or the most important, trades in any particular locality could be put under one comprehensive enactment as to the employment of the young, no harm would be done, for things would continue relatively as they are.

2. *Mr. Mitchell.*—Am the cashier at Messrs. Molineux, Webb, and Co. About a month or so before Christmas is always our very busiest time; we are dreadfully bothered just now to get our frosted work done rapidly enough for our orders.

The flatters, too, are working long overtime; they are on the pressed glass tumblers chiefly, the bottoms of which are rough and uneven, till they flatten them on that kind of horizontal grindstone which you see; that is called a Jenny Lind machine. The press is so rapid in its production, as often to get ahead of the flatters, so they have to work overtime, when the demand for pressed articles is great, in order to keep up with the produce of the glass-house. They ordinarily make overtime twice in the year, and from two to three months each time.

With the cutters it is not so usual to have overtime; they have been working this week past till 8½ p.m. from 6 a.m., and will continue to do so till after Christmas, but at this season last year they made no overtime; it is two years since they were working till 8½.

Colic is a frequent complaint among glass-cutters; that arises from the putty powder used in polishing. The drop wrist is also characteristic of cutters; we have had lots so affected; that is the result of the way they have to hold their hands; they generally sit to their work.

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3. *Isaac Webb*, foot-blower.—Am 18; began at 11 years old as a taker in; many here now, boys and young men, can't read or write; I can. I got mine on the Fridays and Saturdays, and sometimes at night school.

4. *James Hammersley.*—Am 13; am flatting tumblers; have been here a good while; am working now from 6 a.m. to 10 p.m. on Tuesdays, Wednesdays, and Thursdays; that has been so for more than a fortnight; it was the same last Christmas. Go to Sunday school; can't read.

5. *Richard Mather.*—Am 14; have been here 9 weeks; was half-timer in factory for two years before that; went to factory school then; can't read now; have forgotten. Am a flatter; work from 6 a.m. to 8½ p.m. twice a week, and till 10 three times a week.

6. *Philip Mac Dowell.*—Am an apprentice, turned 15; have been two years here; am now making 14½ hours a week overtime, the same as the flatters, that is; I should properly be in the cutting shop, but just now I am "punting" these bottles; rounding the bottoms in, that is. I get very tired indeed; the overtime has been going on for about three weeks.

7. *Mary Ann Bray.*—Am 14; began here at 11 years old; am frosting glass; have stayed for the last month till 10 p.m. from 6 a.m.; all the girls in this room have, except the learners, who leave at 6; am very tired by 10 at night; have been to day school; can read.

8. *James Baron.*—I am head of this "chair"; have been at these works from a boy; was 7, nearly 8 that is to say, when I first came; began as "taker in"; that is what all do at first; many used to come as young as that; they seldom come under 10 now, not in the glass-house at all events, and most not much under 11. There is a general improvement in conduct and in education too, as compared with what the lads were 20 years ago, especially in the language they use, which is much less coarse than formerly. Still there are a many that can't read at all; even among the men I can count up 15, who don't know more than their letters, and can't write their own name.

It won't do for them to begin too old at glass-making; a lad, who does not begin till 12, will never make a glass-maker. It's easy work "taking in" and "warming in," which is what they soon get to do, holding the glass in the furnace on the pontil. "Taking in" is just running away with the finished glass to get it annealed; the fifth hand in the chair does that; the fourth hand will be older, from 12 to 16; he gathers metal for the foot, and assists the servitor and foot-blower; we used to have only one boy, the fourth hand, in a chair, and that is still the case in many works, but our masters let us have the fifth, and pay him themselves; we are enabled by that extra aid to get through a good deal more work. I dare say I get 2*s.* 6*d.* a week more because of that fifth hand, for we are paid piece work.

It is, I think, by no means a very general habit for the boys to work 18 hours at a time through taking some other boy's turn besides their own. It will happen about once a week perhaps with one boy or another, but generally there are spare lads on the look out for chance work, running about between this and the other glass-works, whom we can employ if the regular one is away. The workman puts up with the deficiency; it is better than having none; indeed, the whole set would be stopped, and could not earn a farthing, if they had not some one to take in and do the boy's work; but the odd one does nearly as well; the difference between the two boys is very trifling in general.

They might, if they liked, always go to school in the afternoon of Friday and the morning of Saturday, and have two nights' schooling in the week besides. Bamford and I tried having a school on Fridays; we could not keep it on then, but before long we shall have a school for glass lads in Manchester.

MESSRS. PERCIVAL AND YATES.

9. *Mr. Yates.*—We have 373 persons in our employ; 48 are boys under 13, nine or ten of whom are only about 10 years old; the youngest of those wash the tumblers, for they are not strong enough to hold the tumbler on the wheel for flatting. Some between 10 and 11 in the glass-house will be "taking in." There is a prejudice among the glass blowers that no one makes a good glass maker, unless he begins young.

We have 75 lads between 13 and 18; some of those will be flatters or cutters, and some in the glass houses assisting as takers in, stickers up, or footblowers.

We employ 31 females, 9 of whom are under 18, but none under 13; some of them frost the glass with a file and sand, but most of our frosting is done by lads at machines; the rest of the women are in the stock room.

Our usual hours for all but the glass houses are 6 a.m. to 6 p.m., and we leave off at 1 p.m. on Saturday; but in the glass houses two sets are employed, who work by turns every alternate six hours from 7 a.m. on Monday to Friday morning, making 51 hours in the week. In the warehouse and cutting shop we occasionally work till 8 p.m., but not more than two or three weeks in the year, about Christmas time.

In the glass houses they have half an hour in every six for a meal; all the other branches have an hour and a half; the latter leave the premises; the glass-blowers eat theirs at their place of work.

As the metal has to be heated in the furnace, and prepared for working, from the Friday to the Monday, and has then to be worked out during the week, night-work is necessary in our business.

10. *Robert Pimlott.*—Am 12 years old. Have been here two years, at the same work, "flatting" tumblers. Never heard of London. Don't know what county Manchester is in. Can't read.

11. *John Billington.*—Am 12. Have been here two years. Go to Sunday school now; used to go to day school. Don't read in Testament or any other book; he (the teacher) tells us about Jesus. Jesus is Christ. I don't know what that means; don't know who the Apostles were; never heard of the Acts of the Apostles.

12. *James Macarthy.*—Am 13. Began here at 10 years old; went to day school for two years before that; learnt to read and write, and do sums as far as long division; go to Sunday school now; can't write or do sums now; can read a bit. (Only letter by letter.—H.W.L.)

13. *John Hackett.*—Am 14. Used to go to day school three years ago, and go to Sunday school now; have just begun to go to night school; can spell a bit, g, l, e, s, spells glass. (Reads a very little.—H.W.L.)

14. *Francis Maculloch.*—Am 14. Have been here five years. Used to write and do sums, as well as read, but can only write my name now; it's so long since I went to day school that I have forgotten. I could always go to night school now if I liked, but I don't. (Reads tolerably.)

ST. HELENS.

MESSRS. S. AND C. BISHOP AND CO.

15. *Mr. S. Bishop.*—We have 152 persons in our employ, 16 boys under 13, 20 lads and 14 girls between 13 and 18, 78 men and 24 women, who are adults.

The information which you have obtained in our works is in the main correct. In the glass house the boys and men work in sets, one from 7 a.m. to 1 p.m., and the same set again from 7 p.m. to 1 a.m., the other set taking the hours 1 p.m. to 7 p.m., and 1 a.m. to 7 p.m.; when in full work each set will make 60 hours from Monday morning to Saturday morning;

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from that there must be deducted 10 half hours for meals, making 55 working hours as a maximum for the week; that, however, is seldom fully kept up for a month together, owing to various accidents, such as the breakage of furnace pots and the like. At this moment, for instance, in one of our furnaces, where there should be five pots, there are only three; consequently there are two sets for each of the absent pots not working just now. For the greater part of this year, I should say, each set will not have averaged over 8 turns a week, or 48 hours. The only case, in which these six hour turns are exceeded, is when the place of one accidentally absent through sickness or any other cause is filled by another, who is willing to work extra hours for that purpose.

The reason of our not emptying our pots at one "journey," as they do in the crown and other glass works, is simply that our operations are slower, our consumption of metal, that is, less in the same time. They take always one uniform time with very little variation in emptying the pots, making chiefly glass of one shape and thickness. The articles we produce vary in size, weight, and form; for our heaviest one pot would last 24 hours, and might for some things last two or three sets a whole week.

As to the character of our men and lads in the glass house, I dare say there may be some pilferers among them, but they are not, as a class, dishonest. If I know of cases where the boys don't take their money home to their mothers, I only pay the wage into the mother's hand. I have done that sometimes, but the mothers soon get too lazy to come for it. I don't think the colliers' children so much worse than the rest; colliers have a bad name; they used to live as it were isolated from every one, and were rough and ignorant; to some extent they are so still, but towns have grown up round coal pits of late years. I can recollect when coal pits were being worked in the middle of St. Helens; the colliers have now been forced to mix more with their fellows, and have improved accordingly.

My brother thinks that no child under, say 14, should be allowed to be employed, unless he can read and write; that, though it would work perhaps awkwardly for the first few years, parents, however improvident and unprincipled, would soon find that sending their children early to school would then be the only way of turning them to good account. I am very doubtful about drunken and dissolute fathers or mothers,—and they are the only ones, except poor widows, who do not now get their children some education, at all events in St. Helens—looking on so far beyond the gratification of their own bad habits; and on many orphans it would fall very hard. On the whole, I don't see why the half-time system of relays with the condition of compulsory school should not work well in our business. It would be hard though to deprive a lad of 12, who happened to be a good scholar and as strong, may be, as many boys of 14, of the opportunity of earning full wage. In our chain-making room and warehouse I shall try it next year. The men in the glass-house would not like having two boys for the same work at the different times of the set, unless both were equal; but after all it might be done.

It would be impossible to carry on the business without working night and day on the system of sets or turns which I have mentioned. On the Continent and in America, the same system prevails, except that on the Continent they work 12 hours at a stretch, instead of 6 hours as in England.

The system in operation is a self-acting security against almost any increase of the hours of labour beyond 11 in the 24. The great cost of fuel for the preparation of glass prevents manufacturers of it from using furnaces capable of producing more than their full ordinary requirements.

The quantity of the material to be wrought being thus limited, is an additional hindrance to any attempt at working beyond ordinary hours.

The evil of our trade is, that any sudden influx of orders cannot be met by any proportionate expansion of production. Our arrangements are made for the ordinary demand, and our people (when the demand falls off), are therefore often only three-fourths employed. The finishers (grinders or cutters) alone may be said ever to work over-time, to compensate them for being often only partially employed. The overwork of these never exceeds 8 to 10 hours per week, divided among four or five evenings. Our trade is therefore protected by its peculiarities, from any excessive amount of labour on the part either of adults or children.

16. *Charles Taylor.*—I am the general manager of Messrs. Bishop's works. Our young hands are a very rough lot, male and female. I think the latter perhaps the worst; we employ girls from about 16 years old in the cutting rooms; there are two such rooms, one above the other; no men work in them. I put the better sort of girls into the upper room to keep them from being made worse than they are; but I fear they are not helped much by that, there is very little to choose between the two rooms.

Many of them are the children of colliers, who are the worst class of any about, so that home is a very bad school for them to begin with. Many can neither read nor write. Most of their conversation is horrid to listen to, some curse and swear like troopers; not a few have had several illegitimate children; our rule is not to admit them to work again after that, but it often happens that those are amongst our best workers and we can't do without them. There is one there who sleeps with one man or another nearly every night of her life, so they say. There are married women in the same room with them, but I don't know that that does any good. There is that girl H. for instance, the language that her mother uses before her and to her is positively shocking; that is a case of a collier's family. There is another, E., she is 17, her father also is a collier and in work; she earns her 15*s.* a week, but she can't read; the family is large, and they are in a state of sad destitution.

Their hours are from 6 to 6, but for the last six weeks or more the orders have been pressing, and we have had to work there till 9 p.m. as often as not. They have to stand to the work leaning over the trough into which the sand and water falls from the funnel above; they have to hold the glass, which is chiefly lamp globes, and such things for frosting with a pattern, under the small stream of sand and water, which comes from the funnel. The standing is very tiring, and there is a great deal of slopping. Most of them get wet through before the end of the day; the lower room is the worst for that, it is entirely their own fault, or rather, the fault of the messy slovenly habits they have contracted at home. The breast board does not hurt them. They are paid "by reckonings" as it is called in St. Helens, 5*s.* one week, and whatever they can earn beyond that in two weeks, at the end of the next.

> [It is in other words 5*s.* in advance on so much piece work, which generally takes over the week to do; in the collieries they "reckon up" only once in the four weeks, we have it in the alternate weeks.—Mr. S. Bishop.]

Most could earn 10*s.*, if they worked with a will, in every other week, or 15*s.* in the fortnight. Those that do what is called "flatting," get 15*s.* a week. The frosting or obscuring the glass, or rather the mode of producing a pattern on the frosted glass, which is being used in this room, has been recently patented by our Mr. Bishop.

St. Helens is not a very moral place; there are dancing saloons all over the town; nearly every public house has one; the young fellows take the girls there and make them half tipsy, and then there follows what might be expected. I know very well that language, which would show a coarse and depraved mind when used in one class of society, may be merely the result of roughness and a want of refinement in a lower grade; but when the language and the facts

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the habits and mode of life I mean, correspond, as they do unfortunately among these girls, the words give the character.

The boys upstairs in the lamp fitting room are comparatively respectable; most can read and some write; but in the glass-house, where the glass is melted in the furnace pots, and blown or pressed to the shape required, they are a very bad lot. Look at that young fellow, he would rob a man of his kneebone; he is probably the worst; but the habits of all, lads and men, are very bad. Some men here earning 25*s.* and 30*s.*, and some over 2*l.* a week, are not worth a penny at the week's end; they are paid on Saturday, and are off straight to the public, none of their wage finds its way to their family. Lots of the boys never take their wages home; a "taker-in," who will be amongst our youngest, between 12 and 15, will have 4*s.* a week, besides a sum proportionate to the amount of work turned out beyond a certain quantity in the week by the "chair" or set in which he works. I have often had mothers come to ask what their boys had made the last week, as they had seen nought of it.

17. *Joseph Peachey.*—You may call me the foreman of the lamp fitters in Messrs. Bishop's employ. I look after these boys who rivet the chains and make the brass bands and "bucket rings" for the Indian swing or lobby lamp. I say Indian, for it is entirely an export trade, the lamp being quite out of fashion here; but we send out 50 or 60 dozen of them a week, for India, Tasmania, and Australia generally.

It is properly a branch of brass finishing, and has nothing to do with glass works. I don't think such things are made in any other glass works, but here it has been done for 30 years and more; for 22 years I can speak myself, for the last seven of which I have been employed as I am now. There are more than a dozen boys here engaged at this, from 11 to 14 years old; most of them read, they are superior to the glass house lads. We seldom work overtime now; our usual hours are 6 a.m. to 6½ p.m., allowing an hour for dinner, a quarter for breakfast, and another quarter for tea. Three years since we were working till 10 p.m. two or three times a week. Such long hours of course are tiring; otherwise the work is easy. They sit about at tables in any position that suits them. It is all done by hand.

18. *John Clere.*—Am 12. Have been here three or four months. Am a lamp chain maker. We go home for dinner from 12 to 1. Our tea and breakfast we bring with us, and eat it in the workshop. I only go to Sunday school now; used to go to day school before I came to work here; was there for two years. (Reads a little.)

19. *George Rigby.*—Am going 14. Have been here two years. Used to make chains; am now "getting out shade mounts." All our work up here is easy, if the hours are not too long. I have been to a day school, and go to Sunday school now. (Reads tolerably.)

20. *Rowland Needham.*—Am 14. Have been here five months. Was at the Scotch foundry before I came here for six months; there I was errand boy in the moulding shop, and used to take in castings and mix the sand; there were 11 or 12 boys there beside me; I was the least; they were in the moulding and fitting shop and minding the engine. Before that I was for 14 months at the gas works; I used to go about with the gas-fitter, waiting on him. I go to Sunday school now, and went to day school for five years before I began work anywhere. I can read and write. I think I have forgotten sums. Here I am a rivetter. Our hours are a little longer than they were at the foundry, for we used to work there from 6 a.m. to 5½ p.m., but I often stopped till 6 to slack the furnace; still that was much the hardest work of any; I used to get very tired there.

21. *Phœbe Holland.*—Am 17. Have been here two years. Went for a short time to day school when I was little, but had to leave soon and go home to wash and clean. Can't read. This working with sand and water is very wet and dirty work. The breast board is to prevent the sand from splashing upon us off the wheel; we don't lean on it much, not so as to hurt. The standing tires.

22. *Helen Clark.*—Am 19. Have been here only a few weeks. Was, before that, in a mill at Stockport for nine years. Learnt to read as a half-timer there. Liked that work better than this.

[This girl could read well, and was decidedly superior in demeanour, and apparently in general intelligence, to most of her fellows. As she was a stranger, I could not correct my own impression by further inquiry from other persons.]

23. *Elizabeth Massey.*—Am going 17. Have been here four months. Was a fustian cutter for four years before at Warrington, in Welsby's shop; was there when you came to look after us. That was harder work than this frosting glass is. It was so wearying all day to swing backwards and forwards from one leg to the other at the frame. We were working overtime here last week from 6 a.m. to 9 p.m.; I was tired, but not so much as at cutting sometimes.

Have never been to day or night school, not even Heathside school at Warrington; went there sometimes to Sunday school at the parish church. Can't read at all.

24. *James Moore.*—Am going 17. Have been here over three excursions, that'll be about 2½ years. Was before in the warehouse at the Crown Glass Works, Messrs. Pilkington's; I used to go to their school three or four nights of a week. All their young hands have to go three times in the week either to day or night. I go to Sunday school now. Can read middling. My work here is cleaning the moulds for the pressers; the hours are 7 to 7 and no overtime. There are a good many boys in the glass-house as old as me who can't read.

[25. This, according to my subsequent experience, is a slight exaggeration; few however of the glass house boys could read decently.—H.W.L.]

26. —— *Myers.*—I am 22 now. Am the youngest "chairman" in the house. Have been through all the stages. Began by "taking in" at 12 years old. Was a "footmaker" at 16, and then for three years "serving." I am a teetotaller. I often take home over 2*l.* a week. We work here in turns of six hours on and six off. In the flint-glass works generally the pots are always being fed with metal; we nearly empty ours and then refill; but do not do it in a single "journey," as they do in the crown and the bottle works. The boys might perhaps get an hour's schooling in their off times, but what with coming and going twice each way, and getting meals and sleeping, there isn't much time for school. There is half an hour in each turn for meals allowed, but they want more than two meals in the 24 hours. They don't know much, boys nor men, here.

THE ECCLESTON FLINT GLASS WORKS.

27. *Mr. Wood.*—I am manager of the Eccleston Flint Glass Works. Our works are much the same as Mr. Bishop's. We have about 20 lads from 12 to 15 years of age; they are a bad ignorant lot, I fear, most of them. We generally fill our pots on Friday night, so as to be ready for working on Monday, and then work eight turns of six hours each, that is the most for each set, 48 hours in the week. The boys are all paid by us and not by the men, the takers in 3*s.* 6*d.* and the stickers up 4*s.* a week. A short time since they all, the boys that is, struck because we were paying one "taker in" 4*s.*; we had to threaten their parents that we would summon them for leaving without giving a week's notice, and that brought them

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round; we continue to pay that boy the 4*s*., but it was very inconvenient for us, while the strike lasted; they are independent enough.

We scarcely employ any under 13; if we did, I dare say we could manage with four relays instead of two, as it is in effect now, but we don't like them very young.

WARRINGTON.

Messrs. Robinson and Bolton.

206 persons are employed here; 19 boys are under 13, 54 boys and two girls are between 13 and 18; of the 131 adults, 11 are females. The youngest is 10 years and 9 months old.

28. *Mr. Robinson.* — The heat and glare of the furnace in the glass house has no ill effect upon the eyesight of the men. The cutters' hands do become cramped. That has been attributed to the putty, but I think it is merely the cold water that causes it. They find the putty gets on their stomach and makes them sick at times. Some go off young, others live to a good old age. A very great deal depends on the workshop; where there is no ventilation it is bad for the cutters; in some small places it is very bad, I know.

We commence work at 6 a.m. and leave off at 6.30 p.m., except in the glass-making department; there the work is continued without intermission by relays or turns of six hours each, by two sets of hands, till the pots are empty, which is usually the case about Thursday morning in each week. Eight boys under 13 are employed there; they take refreshment during their "turn" without leaving off work.

Glass-making could not possibly be left off during the night, nor could the men do without the boys' assistance.

In the cutting department they occasionally work on till 8.30 p.m., but the average of such overtime is less than a month in the year. They leave at 12 at noon on Saturdays. Half an hour is allowed for breakfast and an hour for dinner; those who wish may take refreshment on the premises between 4 and 6.30 p.m. When the cutters are working till 8.30 p.m. an extra quarter of an hour is allowed for refreshment.

> [I examined several boys here; one or two of them could only spell out their words; some read tolerably.—H. W. L.]

PLATE GLASS WORKS.

ST. HELENS.

The British Plate Glass Works, Ravenhead.

29. *Mr. Crossley and Mr. Sieveright.* — There has always been a great deal of interest felt in the welfare of the hands employed here, and especially in the education of the young. This place is a sort of colony, the greater number of those employed in the works live in cottages on the premises. There is a large school-room, both for girls and boys, and a master and mistress; the attendance is tolerable, but not what we could wish. The boys' school has been lately recommenced; for some time before this it had been discontinued for want of a proper master. We are now hesitating whether or not to make it compulsory, but on the whole think that will be necessary. Parents forget that when they were children they did not suffer nearly so much from want of education as their children do now; for since that time very much more has been done towards spreading knowledge among the working classes, and a young person, who cannot read and write, goes with a positive disadvantage into the labour market; still there are many here, earning their 2*l.* and 3*l.* a week, who prefer sending out their children to make a little money, to letting them have a chance of a decent schooling.

We think it better for them to pay something; they value the education more, if they give value for it; besides, the parents who pay don't like the money being lost; so they say, "if we have to pay for our "child's schooling, to school he shall go."

Our girls are, generally, fine, healthy, and well-behaved lasses; there is no class of female operatives that surpasses those in plate glass works; there are only six such works in the country; ours, the Union, and the London and Manchester, three of them, being all in this immediate neighbourhood. Ours has been established nearly a century. We haven't many boys on the works, only one under 13; there are four or five in the smoothing room, they will be about 13; some in the polishing rooms and clay sheds, two or three "call" boys in the casting house, and one who assists the grinder by fetching emery; in all 33 under 18. We have 304 male adults, but the older lads from 16 or so work in the sets with the men.

The reason of there being many more boys grinding in the other plate glass works, as you say is the case, is probably that they have not the same machinery that we have; ours moves both the iron runner above, and the plate of glass below at once, and is too heavy to trust with boys; but generally speaking the plate of glass is fixed on a stationary "bench," over which the runner only moves; the surface of the plates ground by the latter process will be 70 or 80 feet, but in ours it may be 400 feet; that surface will in neither case probably be a single plate; a boy can as well throw sand and water over a 400 feet glass surface as over 80 feet, and that is what the boy would have to do, but there might be accidents, so we prefer men.

The hours are tolerably regular for most of them, from 6 a.m. to 6 p.m.; no machinery works just now after 12 on Saturday, but 4 p.m. is our usual time on that day, unless there happen to be a break down; we are bound by agreement among the plate glass works not to make over 66 hours a week, it used to be 48. The machinery does not stop for meals; those employed in polishing therefore get them as they can. The work continues for five days; the "call boys" in the hall, who also sweep and clean up, are the only irregular ones, and they will never be on more than 12 hours; they have to summon the men, when the glass in the furnaces is ready for casting. We ought to be able to cast always at one time, as they do on the Continent, but we have yet to learn that secret; as it is, they may be wanted at any time, day or night; for though they start evenly at the beginning of the week, one set for the day and another for the night, they get jumbled up by the end.

We employ most young persons in the smoothing rooms; all but a few there are women. Out of 146 females in our employ 29 are between 13 and 18; there are none under 13, we don't like taking them very young. Most of those who come under 16 will be "colts," come to help a mother, sister, or friend; we have nothing to do with the colts so far as paying goes; they come to learn, and sometimes they have arrangements among themselves for sharing what the two earn. It is all piece work, some earn 6*s*., some 12*s*., some 18*s*. a week; a girl of 16 who was a good worker might earn 16*s*.

We don't like their coming young; we have twice had to send away a dozen girls or so who were too young, 13 years of age or a little more; they would be colts.

There is very seldom any overtime with them; their work is limited by the amount the furnaces can

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produce, and that is only a certain quantity in a certain time. We have indeed too many smoothers; they have at times to wait for the grinding to have finished, when they work up too fast; there are times when to complete an order unusually pressing we may use up some glass that is in stock and run the machinery a few hours over; then the smoothers too might work longer, but we generally keep the boys for that; as a rule there are few trades with so steady a demand and so little liable to sudden exigencies as ours. The smoothers often give over by 4½ p.m.

The red polishing matter is burnt copperas or sesqui-oxide of iron; it is not injurious, though it gets all over them, and indeed into them at last, for the men tell us that they often find on a Sunday afternoon a complete deposit of it on their skin, though they have had a thorough wash in the morning.

We have no objection to our hours being limited to 10½, but they cannot be within a fixed time. Owing to the immense heat of our furnaces we cannot let them out; as soon as the bricks cool they crack in all directions; so if a furnace does go out we have to pull it down and light a new one, unless it has been working only a very short time; this, and the irregularity to which I have already alluded in the time of casting, make a prohibition of night work impracticable; at the same time our practice of working in sets renders overtime in that department, the casting hall that is, impossible.

We must also be allowed to work at night, and overtime in the event of a break down to the machinery, such as happened for example last year in our polishing rooms; we have 35 benches there, but by an accident of that kind were reduced for two months to 11; during the whole of that time therefore we had to work in shifts or relays night and day, in order to keep up with the other portions of the works, where the ordinary supply was being produced in ordinary hours of labour.

30. *Elizabeth Ashcroft.*—Am 15½ years old; shall have been here two years next May; am a smoother; that is what all the girls are. Our hours are from 6 to 6, and sometimes to 7; we are not once a month as late as 8 p.m. It is very hard work; we have always to kneel on those large plates to do the middle part, the sides we can do standing; our knees get very wet, but we change when we go home; no harm seems to come of it.

31. *Louisa Pennington.*—Am 17; have been six months smoothing; was at coal-pit-brow riddling* for two years before that. All that Ashcroft has told you is right; this is much better than the other work; there our hours were from 6 a.m. to 5½ p.m., but it was harder; besides when we had a deal to do we often worked all night; two or three nights a week I have worked all night. Can read a bit.

32. *John Fryer.*—Am a smoother; was 13 last September; have been here seven months; in that time stopped only once as late as 9; that was to meet the machinery, which was working overtime as we were short of glass; have sometimes stopped till 7 p.m.

UNION PLATE GLASS WORKS.

33. *Mr. Yates.*—I am the manager of these works. Our hours are from 6 a.m. to 6 p.m. for all but those employed in casting, and those are all men. We have perhaps once a month to keep some as late as 8 p.m., grinding, or smoothing, or polishing; those are the processes at which our younger ones are employed. We have 7 boys and 4 girls under 13; 68 lads and 59 girls between 13 and 18; 315 men, and 87 women. The females are all engaged in the smoothing process. That is all hand work. All the younger ones are "colts," come to help a bigger girl or woman; they sometimes are too numerous for order, so we have to send a dozen of them off at once. They are not in our pay. It is wet work, but they get no harm. They will earn 4*s.* or 5*s.* at first. The boys are put to the grinding machines to begin with, and are promoted by degrees. They commence at about 12 or 13 years old. The younger ones are taken out of charity. They get wet too at grinding. They have to scatter the sand on the surface of the glass that is being ground by the machine. The grinding machines do not stop for meals, but after each sand grinding process, which will take about five hours, they are ground again with emery for about an hour and a half. The boy has nothing to do with that, so in every 6½ hours he has 1½ hours for meals and rest.

I think that most parents but the very lowest give their children some education now; still, it would be very hard on many, orphans, for instance, to make them produce some certificate of attainments, however low, before they might be employed at all.

You may take it generally that the main features in our works correspond with those of the British Plate Glass Works at Ravenhead. We have boys and younger lads at the grinding machines; that is the chief difference. If you make those of them and of the smoothing girls, who are under 13, half-timers, we should probably take none of that age. However, as to the smoothers, they are paid by the piece, and none so young as 13 by us, I should say.

[34. I inquired of 18 girls and boys in these works, and learnt that four, two of either sex, were unable to read at all, and one other, a girl of 18, scarcely knew her letters; of the rest, six or seven read tolerably.—H.W.L.

CROWN AND SHEET GLASS WORKS.

ST. HELENS.

MESSRS. PILKINGTON.

35. *Mr. W. Pilkington.*—The evidence which you have read over to me is in the main correct. We employ, one way and another, a large number of hands, at the present time over 2,000 in all; there are 134 boys under 13, and 132 lads from 13 to 18. The number of women and girls I cannot give you accurately; they are at the factory and Eccleston, and are chiefly smoothers. There will be over 150, I should say. About 100 of the lads are bound apprentices to us.

We have always tried to do what we could for our hands in the way of giving them opportunities for recreation and improvement. We are just fitting up a reading room for them to use in the winter; they will have billiards, and draughts, and other games there, conveniences for washing, and a refreshment bar for tea and coffee and light drinks. In the summer they have a cricket ground, where they can also play at bowls and skittles.

36. *Mr. Johnson.*—I am the master of the school which Messrs. Pilkington have established at their Crown Glass Works, St. Helens, for the younger hands in their employment. The school has been in existence for 12 years. I have been here since last Christmas, nearly a year; before that I was for five years master of Messrs. Schwabe's school at their large print works near Middleton.

I am all day long either here in school or about the works looking after the boys, so, as Mr. W. Pilkington just said to you, I dare say I can tell you as much about the boys' employment as anybody, for I make it my business to know and to understand all about it.

All the lads up to 17 years of age have to come to

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* A sort of screening process.—H.W.L.

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school three times a week, whatever branch of the business they are in, so we have them not only from the glass-houses, as they are called, where the furnaces are, that is, and where the majority are at work, but from the warehouse, the crate-makers, and all the incidental occupations, so to speak, about 260 in all. There were 80 who could not read when I first came, and who are now in the first "Irish" book. I found them very unruly and irregular; they had not been properly managed by my predecessor. Nothing is or was paid by them in the shape of school fees, but there was a penny fine each time that they missed one of the three necessary attendances without good excuse; and the fines when I first came were amounting to from 25*s.* to 30*s.* a week; now they don't exceed 1*s.* They go towards books for the library and other expenses.

I got them into this good attendance by making it a point of honour with the different "houses," of which there are 10 working at present, to have the fewest absentees. They used to duck all who went to school, but now they "rundle" any one who don't; that is, put him in a ring of them, each of whom pulls his hair.

The great thing was to get the help of the managers. Each house has a manager over it, and they are all with us; they see that the boys come to school, or will "know the reason why." Every manager is required by Mr. R. Pilkington to come here once a week and examine my entries of attendance.

The boys who are engaged in the daytime, those in the warehouse, and elsewhere other than the glass-houses, come to night school three times a week from 6 to 7 a.m. or a little past. With the boys in the "houses" we have to contrive our hours so as to suit the times they come off work, for those times vary, both in different houses and in the same on different days. The average is from 10 to 12 hours' work, and then a break of about 30 hours, that is four journeys a week, so that they have four opportunities of going to school. There is, however, a class of lads, 20 in all, called "pushers," working in the "houses," whose hours depend a great deal on the men, the "flatteners," for whom they "push." The flatteners' work depends partly on themselves, and partly on the rate at which the cylinders which the blowers produce accumulate. Among them there is no system, and they work one time 8 hours on and 8 off, and another over 12 hours, and sometimes at night, sometimes in the day; so we have to manage as we can. These "pushers" are the worst boys of any; that I think comes from their being thrown more into the company of the man under whom they work, alone with him, instead of mixing, as the rest do, with boys like themselves. They shift from week to week by turns, working two turns together at the end, so as to make the change; and those that worked between 8 a.m. and 8½ p.m. one week take the night-work for the next, so far as they can. This is only the case with the pushers. I believe they work 12 hours at a stretch only when, as now, there is a "kiln down," and some of the others have to make up the time lost through that. These pushers, who are here now, have come straight from work to school; that is what makes them so dirty. I have told them they may have half an hour for the future to go and wash their faces and hands. They began work at 8 p.m. last night, and left off at 9 this morning (Monday).

They are often very tired when they come after a long turn; I have seen them fall asleep at the desk; I send them home then generally; that boy Roden I have seen fall fast asleep in five minutes, but when I wake him up and tell him to go, he won't; he likes learning, but he is the exception among "pushers."

Lads will earn from 3*s.* to 4*s.* 6*d.* a week; the firm pays them; the men are paid by the piece. Several of our houses are not working now; of those that are, six are sheet and three crown houses; besides these, there is one, No. 8, where they are all either boys or apprentices, that is the "shade" house; the apprentices, who are learning to become blowers of the cylinders, which are flattened, as you saw, into sheets, practise the process in making glass shades for clocks and such things to keep the dust off; the apprentices are usually from 14 to 21 years old. There are 12 boys there.

In the sheet houses, where boys are chiefly employed to help the "blowers," there are 88 under 13, and 71 between 13 and 18; most up to 15 or so are block minders and hold the pontil or pipe, shift the crane, pour water to cool the metal, and have generally to help and be all eyes and ears. The youngest are shovel holders, and have to hold a shield to keep the flame from the eyes of the men, who "gather" the metal from the furnace pots. The "splitters" also, who split the cylinder preparatory to its being flattened into the sheet, have each two "carriers off," who are boys of 13; they are on work when the "houses" are off.

In each crown house there are eight boys either shovel holders or block minders. The warehouse boys cut the glass into squares of the requisite size and pack; there are 30 of them, 16 under and 14 over 13. Then some 20 work at making the boxes and crates and the pots in the clay sheds. At Eccleston too there are seven; there the rough plate is made by casting and rolling; they are chiefly polishers; two are under 13. There are 12 boys in what we call the factory; that and the Eccleston work is day work; they assist in the polishing, scattering the emery and water over the surface of the glass; red lads we call them, for they are red all over, just as millers are white, and make every thing they touch, forms and books, red too. Only two are under 13. In both the last-mentioned places a large number of women and girls are employed in smoothing, but I know nothing of them.

My experience of the working of the Print Works Act, so far as education is concerned, is decidedly unfavourable; the effect of the 30 days attendance at school being allowed to be at any time and after any interval during the half year "together or separately," (8 & 9 Vict. c. 29. s. 23.,) as the clause runs, is ruinous. I may say that my services for five years at Messrs. Schwabe's school were not worth 5*s.* and yet I worked hard, and so did the lads many of them; and there too there was some regularity, for they used to come on Monday and Tuesday in every week; but nothing came of it; by the next week all they learned was forgotten, and the ground had all to be gone over again.

It is the same here to a great extent with the pushers, but that can't be helped, for the flatteners must finish off what the blower makes, or else the glass houses would be choked, and could not go on working; but the amount turned out in a given time by the blower, depends on various accidents, breakage of pots being no infrequent one; and the pusher is very important to the flattener, a good pusher will work like a machine, and cannot be spared till the work is all over; nor can he have a substitute for part of his time.

Very many of the pushers come of bad parents; there is one, 12½ years old, who has been on these works more than three years, and does not know more than his letters; he has a bad father; there is another of 16, who only knows his letters; this one's father is a confirmed drunkard and poacher. Still there are exceptions; I have three very good lads, pushers, who are fair scholars, and well behaved.

37. *Mr. Holt.*—I look after the Eccleston works and the "factory" for the Messrs. Pilkington; the latter was once a cotton mill and keeps its name, but we don't "make" any thing there, only smooth and polish. A large number of women and girls are employed in smoothing; they have not to kneel on the lower plate, as they do in the plate glass works, for our plates are much smaller, and they can reach any part as they stand at the sides.

We only employ those of about 17 and upwards; there are a good many under that age, some only going 15, as you have found out. I thought none

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were so young; but all those are what we call "colts," they come to help a mother or a sister and to learn the work, and after a time, as they grow and we see they work well, we take them on ourselves; some will get paid a little by those they help, and as they get on, two will work together, one of whom perhaps is paid by us, and they agree to divide earnings. Those two girls are between 16 and 17; they will earn 14*s.* or 16*s.* a week together, but it is all piece work, and a great deal depends not only on the speed with which they work, but also on the judgment; they will often spoil what they have done by going on too long.

It was at this polishing machine that the accident happened to the boy you were mentioning; it is scarcely conceivable how he got there at all, his place was along the side of the glass that was being polished by those soft rubbers, where he should have been putting that red stuff on from time to time, but he got away to the back of the machine where the large wheels are, and though the arms, which work the rubbers, form, as you see, almost a fence to the cogs, which are all within them, he managed to put his finger in. Accidents are very rare.

38. *W. Hall.*—Am going 14; don't know my birthday; have been three years here; was a "pusher" for two years, and am now a block minder; the work I now do is hardest; though I was perhaps longer at it before, I have now to run about more. First I heave the jigger on, that holds the water to cool the blowers' pipe, then I turn the metal on the pipe in the furnace; then I put a bit of hot metal on to the end of the blown glass and cut part off again with shears; that is to open the bottom and make a cylinder of it, for it was round before; then the blower puts it on the chevalier, that's a wooden board with four legs, and we get the pipe away for another blow.

The pushers get their hands cut about a good deal by the edges of the glass in lifting the cylinders on to the flag for the splitter; most have scars on their hands. I had plenty, but they have been healing for this last year since I left pushing.

39. —— *Gaskell.*—Am 12 years old; have been here 18 months; was two years at day school before. Am block minder; we are about 10 hours on and 24 off, that is the journey; but we boys always get called about three hours before we start with the men, for we have to sweep up and get ready for them before they come; we could do it all in one hour if we liked, but we like to play in that time; we are called at all times, night and day; the "teazer" or furnace man goes round the town and calls every boy in the "house," when the furnace of that house has heated the metal in the pots enough to start working in about three hours. He comes to the door at home, and knocks and calls "Gaskell," and then, if it's night, my father looks out of window, and the teazer says, "No. — called;" that is the number of the house; so I get out of bed and go off.

40. *William Dombul.*—Am 11; have been here two years; am block minder; used to go to day school; am not so very tired after a "journey;" generally go off straight to bed from work.

41. —— *Mather.*—Am 12; have been here two years; am block minder in No. 10 house. There are 12 block minders and one extra one, four shovel holders, two pipe putters up, two takers off, and four pushers. Those are all the boys in our house. We get meals when we can, "bite and sup" we call it, but there is always a break of about half an hour in the middle of a journey to feed the furnace, yes, and to feed ourselves too. I was going three years at day school before I began here.

[These four witnesses were all fair readers. Dombul spelt, and knew his multiplication table, very well.]

42. *Job Preston.*—Am 16; have been here three years; have lost my right arm, and can write with my left hand; it was by an accident, but not in any works, that my arm was hurt; accidents have sometimes happened to the boys in the polishing room. There is a small boy with only one arm; it was mere carelessness with him; he put his finger between the cog wheels while the overlooker's eyes were off, and got his arm drawn in. That was up at Eccleston Works.*

Before I began here I was at a watchmaker's at Prescot; there are a number of watchmakers there, and a good many boys employed at it. Some begin at 10 years old; I did not till 12; they drill holes in the wheels. I used to work from 7 a.m. to 8 p.m.; it was not hard work.

43. *John Forber.*—Am going 14; don't know in what month my birthday is; it is some time about Newton Races. Am a block minder; have been here two years; was at day school two years before that, but didn't learn much there; didn't know how to read till I came to this school; can't read so much now.

44. *G. Lomax.*—Am 16; have been here six years; was "taker off" two years; now mind block; get 4*s.* for that; used to get only 3*s.* Don't like working at night; would rather work on Sunday than at night. Can't spell my name. Father is a pit sinker; have no mother, but a step-mother.

[Mr. Johnson told me that this last witness had always been a backward child, and was very frightened of everybody; this was attributed to his ill-treatment at home. He did not however answer my questions in such a way as to lead me to think him half-witted or more than neglected.—H. W. L.]

MESSRS. W. STOCK AND CO., CROWN GLASS WORKS, NEAR LEIGH.

45. *Mr. Gray* (manager).—We have 4 boys here under 13, the youngest is 11; there are 18 between 13 and 18. The two females merely sweep up. They are grown women. Our male adults are 54. Eight of the lads work from 6 a.m. to 6 p.m., with an hour and a half for meals; they are not in the glass making department. Those that are work in journeys of about 8 hours; there are four journeys in the week; the time of their commencement and their length depends on the state of the metal in the pots. The pots hold about 30 cwt., and that is worked through in about eight hours; sometimes it may be 10 hours. They may have to begin the week's work at 10 on Sunday night, or not till 6 on Monday morning; so far as we can take an average, the first journey will begin at 3 a.m. on Monday and go on till 11 or 12, then they will be off till 6 p.m. on Tuesday; the second journey will last till 2 or 3 a.m. on Wednesday; the third begins at about 12 on Thursday, and the fourth at 6 a.m. on Saturday. Those under 13 are in this department. They can manage in all crown glass works to get to school on some week days; here they have two or three half days and all Friday. Ours all go several times a week. In the cutting department, where they work only in the day, they don't come till 7 a.m., and they leave at 5 p.m. on the Monday and at 2 p.m. on Saturday. The lads there go to a night school five times a fortnight. "Cutting" with us is merely cutting the circular discs of glass into the requisite sizes, and not, like the flint glass, grinding and polishing.

Glass blowers have a bad name for drunkenness. I have made the major part of our men sober, for I will allow no drink to be brought on the premises. A great deal might be done by employers and foremen in that way if they chose.

The boys are hired and paid by us, and are under an agreement, but not regularly bound; they earn 6*s.* and 8*s.* a week, but some at 16 and 17 can do men's work and get 1*l.* a week. Arsenic is used as a flux instead of manganese, but only in small quantities.

I have been in the business for many years, and

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* See No. 37, supra.

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have worked in it myself, and never found anything unhealthy about it; indeed, I am now teaching my own son. The men pay 1*s.* a fortnight to the sick fund, and draw 24*s.* out, or very nearly, at the end of the year.

I have adopted several simple contrivances for getting rid of the boys' work; for instance, a mechanical jigger with a plentiful supply of water stands at each corner of the "house." It is no more than a pipe with holes, moving on a hinge over a tub of water. Then there is an iron "thimble holder" for the blower to rest the end of the glass against, instead of a boy kneeling opposite him. They do away with a deal of cursing and swearing and knocking down, which didn't do anybody much good. The boys often deserved it, and weren't hurt much perhaps, but they are better without it.

In the blowing the boys will be working rather longer hours than the men, for as soon as the metal in the pot is ready they are called, and have to go and call the men; but the boys' work is not hard.

46. *Mr. Rigby.*—Before I came here, I was among flint glass cutters. I never knew of any case of "drop "hand" among the young men. It is rare at any age. I think it is the pressure of the hand against the wheel, and not the white lead of the putty that produces it. The amount of lead is very small.

BLACK BOTTLE GLASS WORKS.

ST. HELENS.

MESSRS. E. LYONS AND SONS, PEASLEY GLASS WORKS.

47. *Mr. Lyon.*—Ours is a fair type of the black bottle manufacture wherever it is carried on, I believe. There are a good many scattered about in different parts of the country. Messrs. Lightfoot's is the only other one in St. Helen's; that is about the same size as ours, and managed in much the same way. We have five boys under 13, and seven between 13 and 18; there is also one girl under 18 in the warehouse, and 29 male adults. What Hayes has told you of the hours and kind of work is quite right.

The men and boys work together, and at the same time; the hours for beginning work vary from day to day; they are called to work at all times of the day or night according to the time the metal takes to melt in the furnace pots, and then they work on sometimes 8 and sometimes 12 hours, but never longer than that, until the pot is emptied.

I think there is a marked improvement in our bottle hands of late years, both in men and boys; the old men who could not read and write have died out, and now workmen are ashamed if they cannot. It is not the result of any special effort in our trade, but of the general tendency of society to promote and encourage education. Still the children are not yet properly reached; what has been done has been chiefly by means of study as adults, in mechanics' institutes, &c.; however, I think a good number of the younger children in St. Helen's go to school in the day time. In our own works some considerable influence is exercised by our foreman, who is a religious man, and teaches in Sunday school himself.

48. *Thomas Hayes.*—I am the bottle sorter; have been here five years; came first as carter; used to be a farmer up at Rainhill; that's hard work at times for boys, is farming. I've been out in spring as a lad from 4 a.m. to 9 p.m., but then it's open air, and they mostly get plenty to eat in the farm houses about here, and they do eat too; so I prefer farming to this for men and boys as well.

I have three boys who "draw" for me, that is, take the bottles out of the drying-kilns, and pile them in barrows for me to wheel away here. They will sometimes burn their fingers, but there is never much harm done. They work from 6 a.m. to 5½ p.m., and sometimes leave before; on Saturdays always at 4 p.m. They earn about 2*s.* 7*d.* a week; the other boys are rather older than these, over 12 I should say; they "take in" or "wet off," and get 6*s.* a week, besides extra for all beyond a certain number. They work by journeys about 12 hours on and 16 off, 5 journeys a week, starting with their first journey at about 2 a.m. on Monday. Perhaps they will run 10 on and 18 off more often. They have half an hour for each meal, breakfast, dinner, and tea, and take them in the "house." Sometimes they are longer than at others; the younger ones get very tired, when they are long about, and some of them come two miles to work. The work is neither hard nor dangerous; the wetters off have merely to drop a little water on to the neck of the bottle, when hot, to make it break off from the pipes.

49. *Peter Ashall.*—Am 10; began at this work before I was 8. I "draw" bottles for Hayes; have always done that, and worked the same hours as now, 6 a.m. to 5½ p.m., and now and then we have earlier leaving off, 3 p.m. sometimes. Can read. That boy's older than me, and he didn't know what t-h-e spelt in big letters when you asked him.

I also visited Messrs. Lightfoot's bottle glass works at St. Helen's, and Mr. Cartwright's at Warrington, and received there information similar to that above given.—H. W. L.

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OF THE

INSPECTORS OF FACTORIES

TO

HER MAJESTY'S PRINCIPAL SECRETARY OF STATE
FOR THE HOME DEPARTMENT,

FOR THE

HALF YEAR ENDING 31ST OCTOBER 1864.

Presented to both Houses of Parliament by Command of Her Majesty.

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REPORTS

TO THE RIGHT HONOURABLE SIR GEORGE GREY, BART.

Her Majesty's Principal Secretary of State for the Home Department.

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HALF-YEARLY JOINT REPORT OF THE INSPECTORS OF FACTORIES.

Factory Inspectors' Office,
SIR, *Whitehall, 5th December* 1864.

We have met and conferred together upon our proceedings during the past six months.

The two Acts passed in the last Session of Parliament, viz., "The Factory Acts Extension Act, 1864," and "The Bleaching and Dyeing Works Act Extension Act, 1864," have come into operation so recently, that we have not been able to cause all the works thus brought under inspection to be visited by the sub-inspectors of the several sub-divisions; but their visits, as well as our own, are proceeding as rapidly as possible, and we trust in a short time that every work will have been inspected and the occupiers provided with every needful explanation.

We have the honour to remain,
Sir,
Your obedient Servans,
ALEX^R REDGRAVE.
ROBERT BAKER.

The Right Hon.
The Secretary of State
for the Home Department,
&c. &c. &c.

APPENDIX No. 1.

GENERAL ABSTRACT, showing the Total Number of Accidents reported to the Inspectors of Factories during the Six Months ended the 31st October 1864.

TABLE No. I.—*Accidents arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.&F.
Causing death - - -	9	4	2	2	3	–	14	6	20
Amputation of right hand or arm	5	3	9	2	1	–	15	5	20
Amputation of left hand or arm	4	1	5	2	1	–	10	3	13
Amputation of part of right hand	18	18	17	27	10	3	45	48	93
Amputation of part of left hand	12	19	18	18	5	5	35	42	77
Amputation of any part of leg or foot - - - -	1	–	1	–	–	–	2	–	2
Fracture of limbs and bones of trunk - - - -	27	10	26	8	4	3	57	21	78
Fracture of hand or foot -	27	21	17	35	7	2	51	58	109
Injuries to head and face -	18	27	17	24	12	1	47	52	99
Lacerations, contusions, and other injuries not enumerated above - - - -	242	241	301	287	79	40	622	568	1,190
Total -	363	344	413	405	122	54	898	803	1,701

TABLE No. II.—*Accidents not arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.&F.
Causing death - - -	8	2	2	1	1	–	11	3	14
Amputation of part of right hand	1	–	–	1	–	–	1	1	2
Amputation of part of left hand	–	–	1	–	–	–	1	–	1
Amputation of any part of leg or foot - - - -	–	–	1	–	–	–	1	–	1
Fracture of limbs and bones of trunk - - - -	11	3	13	1	–	–	24	4	28
Fracture of hand or foot -	1	–	–	–	–	–	1	–	1
Injuries to head and face -	12	6	7	1	–	–	19	7	26
Lacerations, contusions, and other injuries not enumerated above - - - -	50	22	17	14	2	2	69	38	107
Total -	83	33	41	18	3	3	127	53	180

APPENDIX No. 2.

SUMMARY of the Total Number of Informations and Convictions, and the Amount of Penalties and Costs, in the Districts of the Inspectors of Factories, during the Six Months ended the 31st October 1864.

DESCRIPTION OF OFFENCE.	Number of Informations.	Result.			Penalties imposed.					
		Convictions.	Withdrawn on Payment of Costs.	Dismissed.	5s.	7s. 6d.	20s.	30s.	40s.	£3.
Neglecting to fence mill gearing - - - -	1	—	1	—	—	—	—	—	—	
Allowing children and young persons to work between the fixed and traversing parts of a self-acting machine whilst in motion -	4	2	2	—	—	—	1	1	—	—
Employing children and young persons without registering their names and date of first employment - - - -	24	12	11	1	—	—	—	—	12	—
Employing children and young persons without surgical certificates -	23	12	11	—	—	—	1	—	10	1
Employing children before and after one o'clock p.m. of the same day -	8	3	5	—	—	—	—	—	3	—
Employing children without school vouchers -	11	5	6	—	—	—	2	—	3	—
Employing children, young persons, and women before six o'clock a.m. -	11	5	6	—	—	—	5	—	—	—
Employing children, young persons, and women after six o'clock p.m. - -	68	57	4	7	—	—	47	—	10	—
Employing children, young persons, and women after seven o'clock p.m. - -	4	4	—	—	—	—	3	—	1	—
Employing young persons and women after two o'clock on Saturday -	23	20	3	—	—	—	14	—	6	—
Permitting females to remain in a room during meal hours, whilst a manufacturing process was being carried on -	5	1	4	—	—	—	1	—	—	—
Parents neglecting to cause their children to attend school - - - -	3	3	—	—	2	1	—	—	—	—
Neglecting to give notice of accident to the certifying surgeon - - -	1	-	1	—	—	—	—	—	—	—
Not entering dates of holidays or lime washing in register - - -	1	—	1	—	—	—	—	—	—	—

DESCRIPTION OF OFFENCE.	Number of Informations.	Result.			Penalties imposed.					
		Convictions.	Withdrawn on Payment of Costs.	Dismissed.	5*s.*	7*s.* 6*d.*	20*s.*	30*s.*	40*s.*	£3.
Making false entries in the register of young persons	1	—	1	—	—	—	—	—	—	—
Wilful obstruction of the sub-inspector in the execution of his office	1	1	—	—	—	—	—	—	—	1
Total	189	125	56	8	2	1	74	1	45	2

The Total amount of Fines inflicted, £172 7*s.* 6*d.*
The Total amount of Costs, £77 5*s.* 8*d.*

REPORT of ALEXANDER REDGRAVE, Esq., Inspector of Factories, for the Half-year ending the 31st October 1864.

Factory Inspector's Office,
5th December 1864.

SIR,

I BEG to submit to you my Report, now due.

In the early part of the half-year I was engaged in making arrangements for the administration of the Factory Acts Extension Act, 1864, and the Bleaching and Dyeing Works Act Extension Act, 1864, in re-casting the sub-divisions of the sub-inspectors, so as to provide for the inspection of the works brought under our superintendence by those Acts, in preparing the necessary documents to be forwarded to the occupiers of the works embraced by those Acts, and in appointing certifying surgeons in numerous localities, where none had hitherto been required.

I found that there would be about 1,400 new works to be inspected, and you were pleased to approve of three additional sub-inspectors being appointed to my district, in consideration of this addition of labour. Having completed the preliminary arrangements, both in regard to the sub-divisions of the sub-inspectors, and to the selection of gentlemen to hold the office of certifying surgeons, I distributed the abstracts of the Acts, with other documents, to every occupier in my district.

I then proceeded with the sub-inspectors of the several subdivisions to visit as many of the new works as possible, and, up to the 31st of October last, I had inspected works in and about London, Bow, Stratford, Waltham Abbey, Swadlincote, Church Gresley, Denby, Sheffield, Manchester, Bury, Pendleton, Over Darwen, Oldham, Royton, Ashton-under-Lyne, Liverpool; and I continued, after the last-mentioned date, to visit the new works in various other parts of my districts, the names of which will be given in my next Report.

The following is a list of the grants made to day schools attended by factory children during the six months:—

		£
To the National School,	Holmfirth - - -	5
,, ,,	Harpurhey - -	10
,, ,,	St. Peter's, Ashton-under Lyne - - -	10
,, ,,	St. Thomas's, Halifax -	10
,, ,,	Morton, near Bingley -	10
,, ,,	Haslingden - -	10

,,	,,	St. Peter's, Blackburn	10
,,	,,	Heaton, near Shipley	10
,,	,,	St. Thomas's, Preston	5
,,	,,	St. Paul's, Staleybridge	15
	,,	Scissitt, near Huddersfield	10
,,	,,	Illingworth, near Halifax	10
,,	,,	St. Paul's, Preston	10
,,	,,	Haworth, near Keighley	10
,,	,,	St. Michael's, Wakefield	5
,,	,,	Millbrook, near Staleybridge	10
,,	Church Schools, Meltham, near Huddersfield		10
,,	Wesleyan School, Scarr Hall, Haworth, near Keighley		5
,,	College Hill Independent Schools, Bradford		15
			£180

The list of prosecutions is given as usual in the Appendix. There is nothing which requires especial notice. The fines amounted to 93*l.* 7*s.* 6*d.*, and the costs to 52*l.* 5*s.* 8*d.*

The passing of the Factory Act Extension Act, 1864, and of the Bleaching and Dyeing Works Act Extension Act, 1864, has enlarged very considerably the nature of the duties to be performed by the inspectors and sub-inspectors of factories. Up to the year 1845, there was but one code of regulations in force, that of the Factory Acts; in that year the Printworks' Act was passed, enacting a series of regulations, which, happily, have not formed a precedent for subsequent legislation. No change was made until 1860 when the Bleaching and Dyeing Works Act was passed, and in 1861 the Act for regulating Lace Factories was passed. In these cases the employments placed under restriction were connected with the manufacture of textile fabrics by the aid of steam or water power. There were two conditions to which an employment must be subject to cause it to be inspected, viz., the use of steam or water power, and the manufacture of certain specified fibres. The Acts of last session however, embrace a diversity of occupations the customs in which differ greatly, and the use of mechanical power to give motion to machinery is no longer one of the elements necessary, as formerly, to constitute in legal phrase, a "Factory."

The following are the trades brought under the regulations of the Factory Act by the Act of 1864.

The manufacture of earthenware,
,, lucifer matches,

The manufacture of percussion caps,
„ cartridges,
The employment of paper staining,
„ fustian cutting,
The processes of finishing, hooking, lapping, or making up and packing,

and I proceed to give the result of my inspections, as shortly as possible, in the above order.

MANUFACTURE OF EARTHENWARE.

The definition of what shall constitute an earthenware manufactory is so general, that it includes a very great variety of establishments, which are therefore now placed under the operation of the Factory Acts. I found a very general opinion to prevail that the Factory Acts Extension Act, 1864, was a "Potteries Act," and many manufacturers of earthenware goods, not being what are technically called "Potters," were not aware that the Act would reach any establishments, except those in the "Potteries;" but upon an explanation of the real terms of the Act, I have had no difficulty in obtaining a ready assent in carrying out the provisions of the law. The manufacture of earthenware in my district, comprises, I believe, every kind of articles made, from the diminutive toy tobacco pipe to enormous jars and gas retorts, from articles of the finest china and most delicate form to goods of the commonest clay and rudest design.

There is no one place in my district in which the earthenware manufacture is the special industry of the locality, in the same manner as Derby is a seat of the silk trade, Nottingham of lace and hosiery, Bradford of the worsted trade, &c., but it is spread over many counties, and extends to many towns. Thus, in Lambeth there are establishments for the manufacture of stoneware; at Leeds, Castleford, Swinton, Rotherham, Newcastle, Sunderland, for the ware ordinarily in use; in Glasgow, for fine and coarse earthenware; near Edinburgh, for coarse earthenware, &c., but as a general rule the manufacture follows the custom of the "Staffordshire Potteries."

The application of rules, such as the Factory Regulations, to an occupation like that of a potter, is undoubtedly attended with considerable inconvenience, at first, both to the masters and to the operatives, from the manner in which the manufacture is carried on. The operatives contract to make certain articles of earthenware at a certain price; the master finds the shop and the material; the operative is paid according to the number of pieces which he produces, and is entirely his own master as to his time and the number of persons whom he may employ to assist him. Each operative, too, works independently, and is not a part of a system so thoroughly interwoven as the system of textile manufactures. The operative can work leisurely or industriously; he may and generally does begin late, is not always punctual at his meals, and works late. Thus the habits of a past time have to be changed, and an entirely new system of work to be introduced.

Regularity of hours of work and of meals are essential under the Factory Regulations, and nothing facilitates this regularity more than the use of gas, and of steam power to move the machinery, because the stoppage of the motive power affects all the machinery in the building, and because it is essential that the moving power and light should be used economically. It is rare to find steam power used in earthenware factories for any process. It is sometimes used to drive the mill in which the component parts of the clay are ground and pulverized, but rarely is it employed in my district to drive what may be called manufacturing machinery. The machines are turned either by the hand or foot of a boy or female, and although there are several occupations in the manufacture of earthenware, which are altogether unsuited for females or children, nothing struck me so much as the employment of girls and children for the mere purpose of giving motion to machinery. A boy sits in a sort of hole, or stands, to turn the throwing wheel upon which the potter forms the ware, or a woman stands at the potter's wheel and turns it for a like purpose. Again, a woman stands upon a treddle, and by constantly jumping gives motion to the machine, at which the turner finishes the ware after it has been partially dried. The boys and the females thus employed are paid by the operative who employs them, and the substitution of steam for this power would lead to a readjustment of prices, *i. e.*, to a reduction in the price paid to the operative for the produc- of his work. The operative is now paid so much per score dozen, he wedges and bats the clay, provides the motive power which turns his wheel, finds his own candle when gas is not provided, and the less he pays for labour the greater is his proportion of the receipts. When the master wedges his clay, makes his bats, and turns his wheel by the employment of steam power, relieving the operative thereby of the expense of certain processes, a reduction in the price for manufacturing the articles will naturally follow, and the fear that that reduction will be more in favour of the masters than of themselves will render the operatives disinclined to the change.

Besides the employment of children and females for the purpose of giving motion to machinery, there are other occupations in our earthenware factories which are of a much more laborious nature, and are performed by children and females. One of these is what is called "wedging" the clay. After the clay has been manufactured, by the admixture of various materials, and brought to the proper consistency, it is necessary to expel from it every particle of air. A piece of clay, weighing generally 70 lbs., is brought to the potter's shop, from the place where it was mixed, &c., by a child or female, one of the assistants to the potter; it is placed upon a slab of stone, and "the wedger"—the same child or female—then cuts off a slice with a piece of string, the slice being as large as the wedger can lift; he then takes the slice in both hands, raises the hands as high as possible above the head, and dashes the slice, with as much impetus as he is capable of, upon the piece of clay left upon the slab. The force drives out the air, and the operation is continued until the clay is free from air.

This is not an occupation for a child. It ought to be done by the workman himself; but not only does he not do it, but he requires his assistant to do it, frequently, as I have witnessed, either before he sets to work, or during the meal times, so that he may not have to wait for clay, or to occupy himself in the laborious work of wedging in the middle of the day. Thus, while the man smoked his pipe at his ease, the child was hard at work, and the length of the child's working day was much beyond that of the man. In some manufactories this wedging is almost dispensed with, the clay being passed through a "pug mill," which is a long cylinder, in the centre of which a shaft, armed with horizontal blades, revolves. The clay is thrown in at the top, the revolving of the shaft draws it down, and it is cut and pressed until it comes out at the bottom almost ready for the workman.

There is another occupation to which children are put which requires a considerable amount of strength, that of "batting." When the clay has been "wedged," one of the children has to prepare pieces of the proper quantity and shape for the plates, &c. This is done by the child taking off a lump of clay—habit enables it to judge of the size—placing the piece upon a slab of stone, then, with an instrument like a stonemason's hammer, about nine inches in diameter, striking it a smart blow. The piece of clay is spread out into a thick pancake by this blow of the size of the plate required. It is called a "bat." A quantity of these bats are made and are placed by the side of the potter, ready for use.

But this may also be done by machinery moved by power, and is so done in one of the factories I have visited.

I mention these two processes especially, because it would appear to be in the interest of the manufacturers, now that the age at which children may be employed is restricted, to have as many operations as possible, especially such as those which I have described, performed by the aid of steam power, and not by manual labour.

Another part of the labour of children and females which is very oppressive is their occupation in the "stoves." These stoves are generally the centre portion of the whole length of the shops, boarded off into separate rooms, and fitted round with shelves to hold the plates, cups, &c., be dried. In the centre of each is a stove or grate producing a very high state of temperature, which is maintained throughout the day. The boys and girls carry the goods into these stoves, arrange them upon the shelves, and fetch them away when sufficiently dried. There is rarely any ventilation in the stoves, and almost as rarely any in the shops themselves, although I have seen stoves in some potteries through which there is a current of air, and in which the goods are properly dried; but I anticipate the very best results from the arrangements which will be made in pursuance of the enactments, which require all factories within the operation of the Factory Acts Extension Act, 1864, to be well and sufficiently ventilated, which will also cause a great improvement in the shops, by causing the removal of the dust which is constantly collected from the dried clay, &c., which is very injurious to the hands.

A very large number of young children have hitherto been employed in earthenware factories; but so far as I can judge from my own district, the number of school children will not be large. The permission to employ children of 11 years of age for a limited period, as young persons, has enabled nearly all the masters in my district to employ full timers only, and a great endeavour will be made, when the age will be restricted to 12, to continue to dispense with school children. Whether they will be able eventually when the age is restricted to 13, *i.e.* in about two years' time, to do without them, will depend upon the power of the masters to supply the places of young children by older hands, or by the adoption of improved machinery. I anticipate, however, that very considerable improvements will be adopted, as soon as the difficulty of obtaining full time hands is felt.

Manufacture of Lucifer Matches.

The manufacture of lucifer matches is chiefly carried on in the Metropolis. At Liverpool, Leeds, Glasgow, Newcastle, Norwich, Aberdeen, there are a few lucifer match factories; in no other town in my district are there any.

Some of the establishments are carried on in large roomy premises, the principals of which are men of capital, and I have invariably found them desirous of adapting their arrangements so as to meet in every respect whatever the new enactments may bring before them, and in fact there has not been room for me to make many suggestions in these larger works, as the shops are generally roomy and fairly ventilated, and various contrivances erected in all for reducing the evils attached to the use of phosphorus.

It would be invidious to name those premises in which it has appeared to me that most pains have been taken; in fact, it would not be an easy task, because in some cases more care has been taken in one direction, and in others, different but equally praiseworthy, arrangements have been made in another direction.

But even in these larger establishments I am satisfied that more attention will now be paid to the means of rendering the occupation healthy. The whole subject has come before the principals in so prominent a manner, that defects which would otherwise have escaped observation have been brought to notice, and I found at every establishment of this class which I visited the strongest desire to carry out any improvements or suggestions that could be offered to them.

I regret that in the smaller establishments, in some of which every process is carried on in one damp, dark, dirty room, I cannot hope for improvement. Removal to other premises is all that can be done, even in the interests of the people themselves, and it is fortunate that the Legislature has already provided the means by which a dangerous or unhealthy trade can be removed from a densely populated neighbourhood.

The Health of Towns Act, 7 & 8 Vict. c. 84. s. 54., passed in 1844, enacts that on the expiration of twenty years from the passing of the Act no building in which lucifer matches are made shall be permitted to remain, under heavy penalties, within 50 feet of any other building, or within 40 feet of any public way. It is well that this regulation should be known; it was proposed, doubtless, for the security of persons who resided in the neighbourhood of such premises, but it will be the means of improving the condition of the lucifer match makers, for the worst class of premises will be closed and new ones can only be established in localities in which there will be space for the erection of more roomy premises, and for a more free circulation of air.

I give the section of the Act to which I have alluded, and I am glad to be able to report that a large establishment, which, from the confined situation and proximity of other buildings it was almost impossible to improve, will be shortly removed to larger and more convenient premises, to the great benefit, I doubt not, of all the persons employed.

"And now, for the purpose of making provision concerning businesses dangerous in respect of a fire or explosion, be it enacted, with regard to the following businesses, (that is to say,) the manufacture of gunpowder or of detonating powder, or of matches ignitable by friction or otherwise, or other substances liable to sudden explosion, inflammation, or ignition, or of vitriol, or of turpentine, or of naphtha, or of varnish, or of fireworks, or painted table-covers, and any other manufacture dangerous on account of the liability of the materials or substances employed therein to cause sudden fire or explosion, so far as relates to the erection of buildings in the neighbourhood of the place where any such business is carried on, and so far as relates to the carrying on of any such business in the neighbourhood of public ways or buildings, that it shall not be lawful hereafter to erect any building of any class nearer than 50 feet from any building which shall be in use for any such dangerous business, but if a building already existing within 50 feet from any such building be hereafter pulled down, burnt, or destroyed by tempest, such building may be rebuilt; and that it shall not be lawful for any person to establish or newly carry on any such business, either in any building or vault in the open air, *at a less distance than* 40 *feet from any public way or than* 50 *feet from any other building*, or any vacant ground belonging to any other person than his *landlord, and that if any such business be now carried on in any situation within such distances, then from the expiration of the the period of* 20 *years next after the passing of this Act, it shall not be lawful to continue to carry on such business in such situations;* and that if any person erect any building in the neighbourhood of any such business contrary to this Act, then, on conviction thereof before two justices, he shall forfeit a sum not exceeding 50*l.* for every day during which such building shall so remain near to such dangerous business, or if any person establish anew any such business, *or carry on any such business contrary to this Act, then, on conviction thereof before two justices, such person shall be liable to forfeit for every day during which such business shall be so carried on a sum not exceeding 50l., as the said justices shall determine*, and that it shall be lawful for the justices also to award to the prosecutor such costs as shall be deemed reasonable; and that if the offender either fail or refuse to pay such penalty and costs immediately after such conviction, then they may be levied by distress of the goods and chattels of the persons convicted, or if there be no such distress, then such person shall be committed to the common gaol or house of correction for any time not exceeding six months, at the discretion of such justices, and that by warrant under the hands and seals of two or more justices of the peace."

The operation in a lucifer match factory which is the most injurious, is that of "dipping" the matches; it is this operation which causes the "jaw disease," which is so frightful in its effects.

The splints of wood having been arranged in what are called "clamps," so that each splint of wood, from 1,000 to 3,000 in a clamp, should be separate, but the ends of the whole even, are handed to the "dipper," who stands over a heated stove or slab of iron upon which the mixture of phosphorus is spread. He presses the ends of the splints of wood into the mixture, hands the clamp to a boy, who carries it to the drying place, the dipper receiving a fresh clamp from another assistant, and so on until he has completed his task. During this time a vapour continually rises from the heated mixture which, as a general rule, the dipper inhales. It is only surprising that men should have been so long employed in this work without any attempt to mitigate the evils arising from it, when much may be easily and inexpensively done to remedy them. For instance, I have recommended a wooden funnel over the dipping-stove, reaching lower than the dipper's face, and spreading over the dipping stove, but so that the dipper has room to dip the clamps, thus carrying the fumes direct from the stove to the outer air; and I have always advised the removal of the dipping apparatus, when in a shop where other persons were employed, to a separate but well ventilated room.

The most perfect arrangement for dipping which I have seen is that in operation at the works of Messrs. Bell and Black, Bowbridge, and I have the permission of Mr. Bell, the senior partner, who has taken great interest in the improvement of the various processes, so as to render the occupation of his workpeople as little objectionable as possible, to mention it in my Report.

The machine is about six feet long, and is covered in with glass sashes. It consists of a roller in the centre turned by a handle coming through the sash; this roller lies in a trough, which is warmed by a steam pipe, and which contains the mixture; there is a table on each side of the roller to the end of the machine, and an endless apron revolves on rollers along each table, so that if anything be placed upon the apron at one end, it is carried up to and over the roller by the apron, and then the apron at the other side of the roller carries it to the other end of the machine. At both sides of the frame work covering the machine, and just in front of and above the aprons, are apertures of the size to admit a clamp of matches.

The machine is thus worked. A window in the frame work is opened and the trough is filled with the mixture. Then a man takes his place at the handle, boys bring clamps of splints and place them through the aperture at one end of the frame work; the man turns the handle, the apron carries on the clamps over the roller, which, by revolving in the trough, carries the proper quantity of mixture; the splints are thus dipped, and the other apron then carries the clamp from the roller, and out of the frame work, through the aperture opposite to the end of the apron, where it is received and carried off into a drying room.

There is a chimney or funnel over the roller and the heated mixture, and thus all the fumes are carried at once far away from any of the persons employed.

The number of little children employed in a lucifer match factory has been very large in proportion to the other persons employed. Men are employed as dippers and as overlookers, women and girls as packers of the matches into boxes, &c., and the children are employed to place the matches into what are technically called "clamps," i. e., the frames containing the splints, in rows each separate from the other. The price for labour of this last-named kind could not be high, and consequently the youngest children have been employed at it. Now, however, no child can be employed in a lucifer match factory under eight years of age, and none under 11 except for half time and attending school. No lucifer match manufacturer whose premises I have visited has retained children under 11 years of age on his premises, unless he has been absolutely compelled to do so from the scarcity of older hands; and I have no doubt there will be a considerable alteration in the processes of the manufacture by the time the Act comes fully into operation, and when children under 13 must attend school for half the day; for already in some factories the frames or clamps are filled with splints by a machine, managed by an older hand, with greater rapidity, and, I have been informed, more economically than under the old system. This machine will, in all probability, be eventually worked by steam power, and a further economy of labour be obtained.

MANUFACTURE OF PERCUSSION CAPS AND CARTRIDGES.

This is a very restricted manufacture in my district. The two principal factories under inspection are well managed establishments. In both of them the bulk of the persons employed are female adults, and the restriction of the ages, under the Factory Regulations, will not make much difference in the arrangements. The principals of both factories expressed their desire of carrying out the Act fully and unreservedly; and it was evident from the various arrangements existing in their establishments that they had considered how to reduce to a minimum the danger of using explosive materials, and to provide to a great extent for the general comfort of those whom they employ.

Paper Staining.

The operations in a paper-staining establishment are very similar to those carried on in a calico printwork. The printing is either by block, when it is done by manual labour, or by the cylinder, which is moved by power.

The principal Paper-Staining establishments in my district are at Over-Darwen, near Manchester, at Manchester and at Leeds; in those factories a large number of children are employed, and steam power is used in connection with machinery. They are establishments, in the midst of the Factory Districts, working very much upon the "factory system," and the Act of last session presents fewer difficulties to them than to the other trades now brought under inspection. The chief objection to the factory regulations is the necessity for the stoppage of all machinery during meal times, and I am glad that paper-staining establishments have been exempted from this regulation for eighteen months after the passing of the Act, as a rigid application of the factory law in this respect would have caused considerable difficulty to the paper-stainers. Many of them have expressed to me great anxiety as to the future, but I have endeavoured to impress upon them the necessity of looking into the matter in time, for undoubtedly the cessation of work during meal times is one of the most important provisions of the Factory Acts, and one which is greatly valued by the operatives. The difficulty could of course be surmounted by the employment of male adults, *i.e.*, above eighteen years of age, during the meal hours, whenever required; but men are not so easily managed as boys, and they require a higher rate of wages.

Mr. Potter, of the firm of Potter & Co., Over Darwen, prepared, in 1860, a bill, to place some restrictions upon labour in paper-staining works, and proposed to adopt most of the Factory Regulations, as modified in the Bleaching Works Act; and I was much interested to find, when

I visited Over Darwen, that the half-time system had been in operation in a portion of the works for a considerable time. In paper-staining works the block printers, always men, are paid by the piece, and the men pay the boys they require to assist them; but the boys employed in connection with the printing by cylinders, which are moved by steam power, are engaged and paid by the principal; and Mr. Potter having full control over the latter class of boys, applied to them as strictly as if they had been under the Factory Act the half-time system, by which each child under 13 years of age attended school daily for three hours. This system is now of course in operation throughout the factory, and although it may appear at first somewhat more difficult to manage with the block printers' boys than with the cylinder boys, yet knowing the determination of the firm that no pains will be spared to adapt their arrangements so as to comply fully with the half-time system, and that it is carried out under the same circumstances in cotton factories in the neighbourhood, I am satisfied it will become thoroughly acclimatized with the works, and give no more anxiety than any other of the internal arrangements.

In the metropolis there are important paper-staining works, but conducted upon an entirely different system from those in the north. At some it has been the custom for work to begin at 7 a.m., and others not until 8 a.m.; the boys are generally required to go earlier to light the fires and sweep the shops, &c., and they are an elder class of boys than those employed in the north. The chief objection in London to the Act is the necessity to commence at 6 a.m.; the men have been so long accustomed to begin late and to continue to work late, and to make overtime, that they do not readily fall into a more regular system; but the masters all acknowledge that the regularity which must be observed under the Factory Regulations will be of immense advantage to them, with this proviso, if the same amount of work can be produced. This I do not doubt; where men are employed at piece work, and can work pretty well as they like, either diligently or lazily, a portion of a protracted day's work is passed in unnecessary idleness. But when work must cease at 6 p.m., I know from experience that the working hours are hours of work, and that the time formerly passed in procrastinating and idling is occupied with vigour and intelligence and with equal results at the end of the week.

FUSTIAN CUTTING.

There are only two places in my district in which there are any considerable number of Fustian Cutters, viz.

Manchester, and in the neighbourhood of Royton, near Oldham.

At Manchester the Fustian Cutters are generally adults, and they are chiefly located in the older parts of the city, about Deansgate, Ancoats, and some in Salford. The shops in which they work are for the most part the top rooms of houses, arranged very much in the same manner as the shops of the Spitalfields weavers, with casements the whole width of the house, so as to give light to the cutting tables which are ranged by the side of the windows. Fustian cutting was originally the occupation of men; the length of the table is about three yards, the cutter stands at one end, advances his foot about a yard, and reaches the end of the table with the point of his knife, he then has to step back about a yard to resume his original position. The muscular exercise is even considerable for a man, and it must be observed that when the cutter stands still to rest his pay ceases until he resumes his work; if the remuneration is ample, he can afford to rest, if it is not he must slave to obtain his living.

The fustian cutters in Manchester are in a most depressed condition, which has been greatly aggravated by the cotton famine. For some years they obtained a fair price for their labour, but some of the master cutters, about 30 years since, introduced the system of infant labour, and the men's wages were reduced to those of the child. If the labour had been one suited for children, it would only have been a natural consequence that children should be employed instead of adults, but the labour of fustian cutting, as I shall presently show, is much too severe a tax upon the stamina of a child, that it ought not to be permitted, and I think that the prohibition of the labour to any child under eleven years of age a most beneficial and humane enactment. But, reverting to the condition of the Manchester fustian cutters, which I have said is now greatly depressed, I cannot show better how the introduction of infant labour has affected them than by quoting the prices paid for cutting within the last thirty years.

Mr. Coles, the sub-inspector for part of Manchester and for Salford, has kindly furnished me with the statement which I annex; and it is important to remember that the appliances of this occupation are the same at both the periods named; the amount of labour is the same; no improvement in machinery has saved the cutter a process, or relieved him of a step backwards or forwards; he finds his own knife, he purchases his own light, and his pay is liable to reduction for holes and damage.

	1825.	1864.
Half-ell velveteens:—	From 1¾*d.* to 3*d.* per yard.	From ½*d.* to 1*d.* per yard.
Two-eighth velveteens:—	From 3*d.* to 4½*d.* per yard.	From 1*d.* to 1½*d.* per yard.
Three-quarter velveteens:—	From 3½*d.* to 5½*d.* per yard.	From 1½*d.* to 2*d.* per yard.
Tabby velvets:—	From 2¾*d.* to 3½*d.* per yard.	From ¾*d.* to 1¼*d.* per yard.

I can bear testimony to the abject condition of the fustian cutters of Manchester, and I heard without surprise the great satisfaction expressed by the operative cutters that they were placed under the regulations of the Factory Acts, and their repeated expression of anxiety that the employment of females and of children after the statutory hours should be strictly prevented, for they hail the application of the Factory Act as the forerunner of an improvement in their condition, in throwing back into the hands of the adult, some of the labour heretofore almost monopolized by the child.

The labour of children has only been resorted to occasionally in Manchester. The master cutters there are not owners of factories, but generally cutters themselves, owning or hiring tables, and it is seldom that one master cutter owns more than six tables. It is in the country districts that the children have been collected in factories, and where the real hardships of the employment have been experienced. Long hours and hard labour are the characteristics of fustian cutting. It is not, as in a spinning or weaving factory, the watching of a broken thread and the tying up of a broken end, which constitutes the occupation,—these unquestionably requiring constant attention, and a certain amount of manual dexterity,—but downright hard work. The following is the nature of the work to be done. The cutting table is an oblong frame, about 8 feet long and 3 feet wide, the piece of goods to be cut is upon rollers at each end of the table, and is stretched taut. The cutter, who has a rapier-like knife with a very sharp point, takes his place at the right-hand end of the table, inserts his knife in the outermost pile at the farther side of the piece of goods, and drives the knive along the series of piles to the end of the table. To enable him to reach to the end of the table, he has to step out with his left foot about a yard, and follow his right arm with his body; and, in the case of a child, the body has been brought so far down upon the left leg that a considerable jerk is necessary to enable the child to recover its position upon its right leg, at the the right hand end of the table, to be ready to insert the knife into the next series of piles. The occupation only need be broken twice; either when the knife requires to be sharpened, which is done by the overlooker, or again when the length of fustian has been cut, and has to be rolled up so as to stretch another length of uncut pile.

Each piece of velvet contains 900 races of pile in width, and the knife has consequently to make 900 cuts from end to end of the frame, on each length of the fustian; and as nine lengths are considered a day's work, it follows that the knife is passed daily over a space of about 10 miles, and the child has to make 8,100 passes of the knife, or, reckoning the child worked ten hours and a half per day, and allowing half an hour for intervals of the fustian cutting, sharpening the knife, and adjusting the lengths of fustian upon the table, it would cut 13 races per minute, thrusting the body forwards and backwards the same number of times.

But the hardship of this kind of labour is more striking when it appears that the actual work of the adult fustian cutters is less than that of the children. The men usually cut velveteens, which contain only 750 races, and they are only expected to cut the same number of lengths as the chidren, viz., nine; and thus they will make only 6,780 passes of the knife, or rather more than eight miles per day.

But fustian cutters have had to contend with another difficulty. The goods are prepared with lime and other materials which are let loose in the process of cutting, and the rooms are frequently filled with clouds of the finest dust, which is perforce inhaled by the operatives. There may be delay before this can be remedied, as the dust is heavy and does not readily rise, and the operatives have the greatest objection to a draught of air on a level with them, but the Master fustian cutters have promised that their shops shall be ventilated as well as possible.

CLEANLINESS AND VENTILATION.

In the Factory Act of 1802, which, in so far as any of its provisions have not been superseded by the subsequent Factory Acts, is still in force, it is enacted that " All and " every the rooms and apartments in or belonging to any

" such mill or factory,* shall, twice at least in every year,
" be well and sufficiently washed with quicklime and water,
" and every part of the walls and ceilings thereof, and that
" due care shall be paid by the master or mistress of such
" mills or factories to provide a sufficient number of win-
" dows and openings in such rooms and apartments, to
" ensure a proper supply of fresh air in and through the
" same."

The subsequent Factory Acts have re-enacted the provision as to limewashing, except that it need only be done once in every fourteenth month, instead of twice a year; but they have not created any fresh regulations as to ventilation, and although the enactments of 1802 would be valid now in cotton and woollen factories the Inspectors have no special directions to enforce them, and they have been treated as obsolete.

Except in some particular processes, and in some particular kinds of factories, and in very old buildings, in which the rooms are low, there has been no necessity for the enforcement of any special enactments to secure a proper amount of ventilation. In the fine spinning of cotton, and in some worsted mills, the temperature is high, and there is a want of ventilation, partly from the belief that yarn is produced better and more easily in close rooms, and partly from the operatives, who object greatly to the admission of air; and in flax factories the atmosphere of some of the rooms is charged with dust and fly from the flax, and in others there is more steam and moisture than is advisable, but, generally, the rooms of a factory under the Factory Acts of 1833 and 1844 may be fairly ventilated by the ordinary means.

But the condition of an earthenware factory, a fustian cutter's factory, and a lucifer match factory, is very different. In the first named the atmosphere of certain departments is maintained at a very high temperature, and in the two first named class of factories the clouds of dust which rise from the materials operated upon, and fill the rooms, are very injurious to the health of those who are constantly inhaling them. In lucifer match factories, the dipping rooms are most pernicious, and other rooms are apt to be filled with the vapour which is evolved by the accidental yet frequent ignition of the matches, both singly and by boxfuls.

These evils have been provided against by the 4th section of 27 & 28 Vict. c. 48., which enacts that the occupier of every factory to which the Act applies shall keep the same in a cleanly state, and ventilate the same in such a manner as to render harmless, so far as is practicable, any gases, dust, or other impurities generated in the process of manufacture that may be injurious to health.

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* Cotton and woollen mills and factories.

The Act has come into operation too recently to enable me to report any particular changes in the arrangements of the different kinds of factories, but in all cases where the matter has been discussed with the principals, the greatest readiness has been expressed on their part to give effect to this enactment.

So likewise with respect to the operation of sect. 5, I am not in a position to give any results. By the 41st section of 7 Vict. c 15., the occupier of a factory who may be proceeded against for a violation of any of the enactments, is entitled to summon any person whom he may employ, and if he shall prove that such person committed the offence complained of, that he had used due diligence to enforce the Act, and that the offence was committed without his knowledge, consent, or connivance, then the said person shall be convicted; but by the 27 & 28 Vict. c. 48., the occupier may make special rules to compel his workmen to observe the required degree of cleanliness and ventilation under a penalty, provided the rules be approved by the Secretary of State. No application has been made to me upon the subject of special rules, and from the conversations which I have had upon the subject, I think it probable that the occupiers will carry out the requirements of the Act in their establishments upon their own responsibility. Nevertheless, as so much of the health ot the operatives depends upon the state of the atmosphere in their workshops, as the best arrangements of the master may be rendered null by wilfulness or neglect of his servants, and as a heavy penalty attaches to the master if his premises be uncleanly or ill ventilated, I think that he very properly has the power of compelling his workpeople to pay strict attention to regulations which he has laid down for the general good.

BLEACHING AND DYEING WORKS ACT EXTENSION ACT, 1864.

The names of a very large number of works were given to me as likely to come within the provisions of this Act; but as they could be exempted by the employment only of males above 14 years of age, full explanations have been given at each establishment, and in a large majority of cases the principals have decided not to employ females or boys under

14 years of age, so as to exempt their premises from the restrictions of the Factory Acts.

I have no doubt, however, that complaints will be made that boys under 14 years of age are sometimes employed, and as the principals do not employ the boys directly, it will be necessary to visit some of these establishments occasionally, in justice to those firms who do employ boys under 14, and who have, therefore, to bring their establishments under the different factory regulations.

Hitherto the operation of the Factory Acts has been chiefly restricted to what are popularly called the Factory Districts, where the factory system prevails, and where the factory regulations are matters of frequent conversation and reference; but the Acts of last session bring within the scope of the regulations, numerous trades, carried on in distant and isolated localities, in which the factory system is unknown save by repute, and I felt it to be of great importance to facilitate as much as I possibly could the work of the proprietors, in putting the hitherto unknown Act into operation in their establishments. It is usual for the inspectors to send to the occupier of every mill, upon its first starting, a copy of the abstract of the Factory Act, and of the notice of meal hours, both which documents are to be hung up in his mill, leaving him to provide himself with the other documents required. Latterly, I have been in the habit of forwarding at the same time a copy of the "Hints upon the Administration of the Factory Acts," which I had drawn up expressly to enable a mill occupier to obtain a knowledge of the general regulations, and of the manner in which he should proceed, But, in the present instance, I had copies of the registers and certificate books put together in one book, and a copy sent with the other documents to the proprietor of every establishment under either of the new Acts. They thus had everything requisite for putting the Act into operation; for instance,—

An Abstract of the Act, to be hung up in the premises;
The Notice of the Meal Hours, also to be hung up in the premises;
The Register of Young Persons; The Register of Children; The Age Certificate Book for Young Persons and for Children, bound in one volume.

> Hints upon the Administration of the Factory Acts, containing a Plain Description of the Principal Regulations applicable to each different kind of establishment.

In fact, no other document would be requisite, except for establishments in which school children are employed, when a school certificate book would be necessary; but there are at present so few establishments in which any school children are employed, that it may be said that every printed document has been supplied to the proprietors which they could need.

I found that very exaggerated notions prevailed of what the Factory Regulations were, and in many instances the "Hints" had shown how simply the chief enactments could be carried out, and had enabled the principals to give effect at once to the New Act.

The first object of the Sub-Inspectors of my district and myself, has been to explain *vivâ voce* to the principals what the law requires to be done, to point out to them how the different regulations will affect the different classes of hands employed on their premises, to assure them of our earnest desire to assist them in carrying out the provisions of the Factory Acts, and to make the introduction into the factories, of the various statutory provisions, to interfere as little as possible with the ordinary routine.

The permission for children of 11 years of age to be employed, for the first six months, as young persons of 13, and for a further period of two years for children of 12 in like manner, and the postponement for 18 months, in earthenware and paper-staining works, of the enactment which requires all the females and young persons in a factory to have their meals at the same periods of the day, have greatly facilitated the work of the inspectors, and have given time for the principals to prepare for the period when the Factory Regulations will come fully into effect.

The necessity for limiting the hours of labour of children and females has been freely acknowledged on all sides. The advantages which masters, as well as operatives, will eventually enjoy from the regularity of work and meals, which will be indispensable under the factory system, are fully appreciated; and although it is natural that some of the regulations should appear unnecessary, and that others, suitable for cotton factories, might appear not adapted for an earthenware work or a lucifer match factory, I have found most of those objections removed upon explanation, and I have met throughout with the utmost cordiality, and strongly expressed intentions to carry out the various provisions of the law fully and frankly.

For the courtesy and for the attention paid to the explanations, whether given by myself personally or by the Sub-Inspectors, I have to express my warmest thanks to the principals and managers of the many establishments which it has been our duty to visit; and I trust, with the communications which will be constantly occurring, that the Factory Regulations will continue to commend themselves to the good judgment and approbation of masters and operatives.

I have, &c.
ALEX. REDGRAVE.

To the Right Hon.
Sir George Grey, Bart., M.P.,
&c. &c. &c.

APPENDIX No. 1.

RETURN of PROSECUTIONS for OFFENCES against the FACTORIES REGULATION ACTS, in the DISTRICT of ALEXANDER REDGRAVE, Esq., Inspector of Factories, during the Six Months ended 31st October 1864.

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
1864.			*Informations laid by Mr. Coles.*	£ s. d.	£ s. d.	
May 31	Obadiah Ashworth, dyer and finisher, Watling Street, Manchester.	Benjamin St. John Joule and C. H. Rickard, Esqrs., Court House, Manchester.	Employing four young persons after 8 o'clock p.m.	5 0 0	2 4 0	5 per cent. deducted from the penalties for Court dues.
"	Peter Jackson, smallware manufacturer, Allum Street, Manchester.	" "	Employing five females and young persons after 2 o'clock of a Saturday.	10 0 0	2 17 6	5 per cent. deducted from the penalties for Court dues.
			Informations laid by Mr. Rickards.			
Aug. 10	G. Murgatroyd, Bingley.	W. B. Ferrand, J. G. Sugden, and William Marriner, at Bingley.	Employing one young person more than seven days without surgical certificate.	3 0 0	0 12 6	
"	" "	" "	Employing one young person without being registered.	- -	0 12 6	Withdrawn on payment of costs.
"	Geo. Bottomley - -	" "	Not lime-washing within last fourteen months -	- -	0 8 6	Withdrawn on payment of costs.
" 18	Thomas Jones, Thornton.	Joshua Pollard, Timothy Horsfall, Alfred Harris, at Bradford.	Making a false entry in school certificate books -	- -	1 6 0	Withdrawn on payment of costs.
" 30	John Eddison, New Wortley.	Jos. Cliff and H. Charley, at Leeds.	Employing one child after 6 p.m. - - -	- -	0 11 0	Withdrawn on payment of costs.
"	" "	" "	Employing one young person after 6 p.m. - -	- -	- -	Adjourned to allow him to summons the man who employed the young person.

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
1864.				£ *s.* *d.*	£ *s.* *d.*	
Aug. 30	Pickard and Hindle, Leeds.	Jos. Cliff and H. Cheveley, at Leeds.	Employing two young persons without being registered.	4 0 0	1 0 6	
	" "	" "	Employing two young persons more than seven days without a surgical certificate.	4 0 0	1 0 6	
"	Howgate and Sherwood, Leeds.	" "	Employing one child before noon and after 1 p.m.	2 0 0	0 9 10	
"	" "	" "	Employing one child without school certificate -	2 0 0	0 9 10	
"	" "	" "	Employing one child without being registered -	- -	0 9 10	Withdrawn on payment of costs.
"	" "	" "	Employing one child more than seven days without surgical certificate.	2 0 0	0 9 10	
Sept. 6	David Stanhope, summoned by John Eddison, Leeds.		Employing one young person after 6 p.m. - -	2 0 0	0 15 0	
" 23	E. and T. Balton, Yeadon.	F. Billam, Dr. Lockley, Timothy Horsfall, As. Fowkes, Esq., at Otley.	Employing one young person after 6 p.m. - -	1 0 0	0 8 6	
"	" "	" "	Employing three children more than seven days without surgical certificates.	2 0 0	1 9 6	Two cases withdrawn on payment of costs.
				- -	0 18 0	" "
"	" "	" "	Employing two children without being registered	2 0 0	0 8 6	One case withdrawn on payment of costs.
				- -	0 5 0	" "
"	" "	" "	Employing four children without school certificates.	- -	1 3 0	Withdrawn on payment of costs.
" 29	Geo. Tenant, Shipley -	Timothy Horsfall, William Pollard, at Bradford.	Employing one young person after 2 o'clock p.m. on Saturday.	2 0 0	0 13 0	
			Informations laid by Mr. Whymper.			
Oct. 13	William Roe Lymbery, Woodborough Road, Nottingham, lace manufacturer.	William Parsons, Esq., Mayor, Richard Birkin, Samuel Newham, J. L. Thackeray, and Wm. Felkin, Esqrs., Nottingham Police Court.	For having unlawfully employed a young person in his lace factory for more than seven days without a surgeon's certificate.	2 0 0	0 9 0	

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
1864.				£ s. d.	£ s. d.	
Oct. 14	John Jones Harney, manufacturer of crinoline steel and crinoline skirts, Granville Street, Sheffield.	Thomas Jessop, Esq., Mayor, William Pashley Milner, William Fisher, and Robert Jackson, Esqrs., Police Court, Sheffield.	For employing a female in his factory after 6 p.m. on August 26th.	- -	- -	Complaint dismissed, subject to a special case in the Common Pleas, the magistrates being of opinion that the respondent's premises were not a factory within the meaning of the Acts.
			Informations laid by Mr. Oram.			
May 19	A. Milne and Sons, Oldham.	J. Riley, Esq., Mayor, and E. A. Wright, Esq., Oldham.	Not securely fencing an upright shaft - -	- -	0 4 6	Withdrawn on payment of costs.
June 2	Jas. Marshall and Sons, Disley.	Richard Sykes and George Andrew, Esqrs., Stockport.	Allowing a young person to work in their factory between the fixed and traversing part of a self-acting mule while the same was in motion.	1 0 0	2 2 6	
Sept. 15	Thos. Rhodes, Hollingworth.	A. Aspland, C. Woolnough, and J. Ogden, Esqrs., Dukinfield.	Permitting five females to remain in the card-room during the dinner hour whilst a manufacturing process was being carried on.	1 0 0	1 6 6	Four cases withdrawn on payment of costs.
„ 21	Executors of the late Joseph Schofield, Mossley.	A. B. Wimpenny and Hugh Mason, Esqrs., Ashton-under-Lyne.	Employing two females and two young persons before 6 o'clock in the morning.	- -	0 19 0	Withdrawn on payment of costs.
			Information laid by Mr. Measor.			
June 23	Messrs. Whitehead, Hope Street Mill, Bradford.	Joshua Pollard, William Walker, and George Anderton, Esqrs., Court House, Bradford.	Employing a young person after 6 p.m. - -	2 0 0	0 17 0	
„	„ „	„ „	Employing the same on three other evenings after 6 p.m.	- -	1 1 0	Dismissed.

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
1864.				£ s. d.	£ s. d.	
Aug. 29	Asa Pyrah, Cloth Hall Mill, Dewsbury.	John B. Greenwood, and E. B. Wheatley Balme, Esqrs., Court House, Dewsbury.	Employing a woman and a young person after 6 p.m.	4 0 0	1 2 0	
"	Isaac Colbeck, Lady Anne Dyke Mill, Southill, Batley.	" "	Employing a young person after 6 p.m. - -	2 0 0	0 11 6	
"	David Wilson, Providence Mill, Batley.	" "	Employing three women after 6 p.m. - -	6 0 0	1 5 0	
"	" "	" "	Employing one of the same women as above on two other evenings - - - -	4 0 0	0 14 0	
"	" "	" "	Employing a young person without having her name on the factory Register.	2 0 0	0 6 0	
"	" "	" "	Employing the same young person, without a surgical certificate.	2 0 0	0 6 0	
			Informations laid by Mr. Henderson.			
May 18	Winkworth and Parker, Wheatfield Mill, Rishton.	Sir W. Hy. Feilden, Bart., Thos. Dugdale, Esq., J. Butler Bowdon, Esq., and William Harrison, Esq., County Court, Blackburn.	Employing a child without having its name registered.	2 0 0	0 13 10	
"	" "	" "	Employing two children without school certificates.	2 0 0	1 7 8	
"	" "	" "	Employing a child without a surgical certificate -	- -	0 11 4	Charge withdrawn on payment of costs.
"	" "	" "	Employing two children forenoon and afternoon of same day.	-	1 2 8	" "
"	Richard Holden, operative.	" "	Not sending his child to school - - -	0 5 0	0 12 10	

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
1864.				£ *s.* *d.*	£ *s.* *d.*	
May 18	Ephrahim Slater, operative.	Sir W. Hy. Fielden, Bart., Thos. Dugdale, Esq., J. Butler Bowden, Esq., and William Harrison, Esq., County Court, Blackburn.	Not sending his child to school - -	0 7 6	0 12 10	
,,	Robert Smith, Great Harwood.	,, ,,	Employing a child without surgical certificate -	1 0 0	1 13 10	
,,	,, ,,	,, ,,	Employing a child without having its name registered.	- -	0 11 4	Withdrawn on payment of costs.
,,	,, ,,	,, ,,	Employing a child without school certificate -	- -	0 11 4	Withdrawn on payment of costs.
,,	,, ,,	,, ,,	Employing a child forenoon and afternoon of same day.	- -	0 18 10	Withdrawn on payment of costs.
,,	,, ,,	,, ,,	Neglecting to report an accident - - -	- -	0 11 4	Withdrawn on payment of costs.
June 22	Samuel Crabtree, Blackthorn Mill, Bacup.	Rev. L. H. Mordacque and Geo. Hargreaves, Esq., Petty Sessions, Bacup.	Employing a child without having its name registered.	2 0 0	0 14 6	
,,	,, ,,	,, ,,	Employing same child without surgical certificate.	- -	0 10 0	Charge withdrawn on payment of costs.
,,	John Greenwood, Operative.	,, ,,	Allowing same child to be employed without sending it to school.	0 5 0	0 13 6	
July 27	George Nowfield, operative spinner.	Thos. Lund, Esq., Mayor, and James Johnston, Esq., Borough Court, Blackburn.	Compelling a child to work between the fixed and traversing portion of a spinning mule, whereby he sustained serious injury.	1 10 0	0 13 6	
,, 28	I. and J. Apsden, Sunny Banks, Over Darwen.	Rev. E. C. Montrion, Rev. P. Graham, and R. S. Ashton, Esqs., Petty Sessions, Darwen.	Employing a child without having its name entered on the register.	2 0 0	1 4 0	
,,	,, ,,	,, ,,	Employing same child without school certificate	- -	0 8 6	Charge withdrawn on payment of costs.

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates, who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
1864.				£ *s.* *d.*	£ *s.* *d.*	
July 28	I. and J. Apsden, Sunny Banks, Over Darwen. „ „	Rev. E. C. Montrion, Rev. P. Graham, and R. S. Ashton, Esqrs., Petty Sessions, Darwen.	Employing same child forenoon and afternoon of same day.	- -	0 8 6	
Aug. 22	Richard Townsend, Helmshore.	Rev. L. H. Mordacque, and Ed. Hardman, Esq., Petty Session, Haslingden.	Employing ten women and young persons after 6 o'clock in the evening.	10 0 0	7 5 0	
„ 25	Jas. Pilkington, Summit Mill, Holywood.	John Thomson Pugan, Esq., and Charles Cheetham, Esqs., Petty Sessions, Heywood.	Employing a young person without having her name registered.	0 0	0 16 6	
„	„ „	„ „	Employing the same young person without surgical certificate.	- -	0 10 6	Withdrawn on payment payment of costs.
Sept. 28	Forrest, Brothers, and Company, Brookhouse Fields, Blackburn.	Thos. Lund, Esq., Mayor, and Christopher Parkinson, Esq., Borough Court, Blackburn.	Employing a young person without having her name registered.	2 0 0	0 13 6	
„	„ „	„ „	Employing same young person without a surgical certificate.	- -	0 3 0	Charge withdrawn on payment of costs.

Appendix No. 2.

Table No. I.—*Accidents arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M	F.	M&F.
Causing death - - -	9	3	2	2	3	–	14	5	19
Amputation of right hand or arm	4	3	7	–	1	–	12	3	15
Amputation of left hand or arm	3	1	4	1	1	–	8	2	10
Amputation of part of right hand	15	12	13	19	10	1	38	32	70
Amputation of part of left hand	12	16	12	7	3	4	27	27	54
Amputation of any part of leg or foot - - -	1	–	1	–	–	–	2	–	2
Fracture of limbs and bones of trunk - - - -	18	8	13	6	4	2	35	16	51
Fracture of hand or foot - -	24	19	14	28	7	2	45	49	94
Injuries to head and face - -	14	23	16	19	9	1	39	43	82
Lacerations, contusions, and other injuries not enumerated above - - - -	186	178	213	214	69	36	468	428	896
Total - -	286	263	295	296	107	46	688	605	1293

Table No. II.—*Accidents not arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M&F.
Causing death - - -	4	1	2	1	1	–	7	2	9
Amputation of part of right hand	–	–	–	1	–	–	–	1	1
Amputation of part of left hand	–	–	1	–	–		–	1	1
Amputation of any part of leg or foot - - -	–	–	1	–	–	–	1	–	1
Fracture of limbs and bones of trunk - - -	8	1	10	1	–	–	18	2	20
Fracture of hand or foot -	1	–	–	–	–	–	1	–	1
Injuries to head and face - -	11	6	7	1	–	–	18	7	25
Lacerations, contusions, and other injuries not enumerated above - - - -	33	17	16	11	2	2	51	30	18
Total - -	57	25	37	15	3	2	97	42	139

REPORT of ROBERT BAKER, Esq., Inspector of Factories, for the Nine Months ended the 31st of January 1865.

Factory Inspector's Office,
Whitehall, Feb. 1, 1865.

SIR,

I HAVE the honour to present to you my Report on the state of the various works in my district, now under the Factory Act, the Factory Acts Extension Act, and the other Acts of Parliament which regulate the labour of females, young persons, and children, in the industrial life of 32 counties in England and Wales, and in Ireland.

The additional works which have recently come under inspection, have added most materially to the duties and responsibities of the office which I have the honour to hold. But the condition of the persons employed in them shows the absolute necessity for supervision, and has strengthened the opinion, I formed five-and-thirty years ago, when first beginning to visit Factories, that free labour (if so it may be termed) even in a free country, requires the strong arm of the law to protect it from the cupidity and ignorance of parents; and to enforce a leisure which philanthropy may adopt and employ when parental feeling fails, in order that the youthful labourer may be instructed in those various duties of life which form its great social charm, and are but the footsteps of religious and intellectual advancement.

The various observations made, and experiences shown in this Report, on the new works which I have visited, will, I think, convince the most sceptical of the necessity for this interference. Indeed, it hardly seems necessary to argue the question; for on all hands there appears the evidence that most of the workshops of this great commercial country are found to have fallen into the inevitable track of competitive industry when unrestricted by law, namely, to cheapen prices by the employment of women and children in the first instance, and then to increase production by protracted hours of work, without much regard to age, sex, or physical capability, or to the need of social requirements. Thus we have thousands of the working classes in a state of semi-barbarity in our very midst; parents, who appear to have little or no natural affection; fathers, who are wholly sensual; mothers, who are without domestic knowledge; children, utterly ignorant and without obedience; and masters who are not perhaps regardless, but who have never duly considered the consequences of congregations formed of such materials as these.

The points which have struck me in my recent visitations as being the most salient, have compelled me to extend this Report into greater detail than I anticipated, or than may at first sight seem desirable; and for this I must apologize. But I have felt it to be essential, that nothing should be omitted which I had seen or learnt in the district, that might be deemed important to the issue of an experiment of such great public interest as the extension of the Factory Act to other works than textile; and that to the manufacturers themselves, both masters and workmen, there might be some circumstances presentable with which they have hitherto been unacquainted, of considerable importance to them in a variety of ways, and capable of exerting a useful influence on the relations by which they are bound together.

With the exception of new works, I have personally been unable to do more than visit a few textile factories in the counties of Leicester and Warwick since the date of my last Report. The sub-inspectors in my district have, however, all been most actively engaged in the discharge of their usual duties; and, with a ready and cheerful compliance with my wishes, have in some instances relinquished their annual holidays to assist me by the performance of double duties, in obtaining as correct a registration of new works as possible, preceding the application of the law to them.

Mr. Sub-Inspector May has been removed from Burnley in accordance with your permission, to reside permanently at Stoke; and the sub-division of Staffordshire has been confided to him entirely. In nearly all my other sub-divisions a redistribution of the works has taken place, in consequence of the great distances which the sub-inspectors would otherwise have had to travel, and the nights which they would consequently have had to be from home. Mr. Haydon has been with me all the time I have been in Staffordshire; for without some assistance with the correspondence which the new Acts have involved, I should have been quite unable to have accomplished my work in any reasonable time. To him I am therefore especially indebted for the additional service which he has rendered me.

I have nothing particular to point out to you on the subject of accidents or of prosecutions. There have been about the usual number both of the one and the other.

The State of Trade.

I ventured to say of the Cotton Trade, in my Report ended April 1864, "a little time will, no doubt, show us what may "be expected for the Cotton Trade. At present, it is in a "very susceptible state, and its future seems pregnant "with more difficulties than one cares to foresee."

Since that date, this susceptibility has been evinced in a most remarkable manner. Every rumour which might preindicate that cotton was coming from America; every rise or fall in the price of money; every doubtful large transaction in business; every failure on a large scale, has advanced or retarded manufacturing operations in a greater or less degree. The consumption of cotton in Great Britain has been larger, it is true, in 1864, than it was in 1863, by 229,281 bales, or about 16 per cent.; but the prices of the raw material are still very high, and without much probability of their being lower. And no doubt these prices are telling very much on the smaller capitalists, many of whom have, for a long period, been hoping against hope, and wishing every day that the war would end. Thus Mr. Sub-Inspector May, in writing to me about his subdivision on the 21st of November last, says, "There have been 35 failures in and about Burnley during the last two or three months."

The fluctuations in the average monthly quantity of cotton taken by the trade, as shown by the annual circular of Messrs. Stead Brothers, of Liverpool, and the general tendency of the market consequent upon different rumours, precisely indicate the susceptibility of which I have spoken; for example,—

	TENDENCY OF THE TRADE.	Average weekly number of bales taken by the trade.
June 24.	"Unsettled state of continental politics checked business" - - -	35,392
July 29.	Bank rate raised to 7 per cent., large imports, prices easier - - -	40,474
Aug. 26.	Very limited demand, prices generally ½ per cent. lower - . - -	23,167
Sept. 30.	Gloomy Manchester reports, continued money pressure - - - -	17,694
Oct. 28.	Opened with great irregularity, closing with more confidence - - - -	20,910
Nov. 25.	Bank rate reduced; Trade buying heavily -	48,597
Dec. 30.	Rumoured capture of Savannah; prices ¼ lower - - - - -	28,940

So far as I can gather, the prevailing idea of the state of the cotton manufacture seems to be, that, for a long time to come (for nobody now professes to be able to see when it will alter), there will be no very great reduction in the price of cotton. As stocks, which are very small, exhaust, there may be more employment; but whether it will be continuous or not, is a problem which cannot be solved, of however deep importance such solution might be to masters and workpeople. These prices then must of necessity be suggestive of extreme caution to the employers on the one hand, and ought to be, of severe economy to the workpeople on the other. No doubt the wealth of those engaged in the manufacture of cotton for many years increased rapidly, and led to a profusion of expenditure upon mills and machinery. But as all this last summer, many of the shallow wells have been dry for lack of rain, and many of the deeper ones have suffered a very perceptible diminution of their waters, so I fear it may be with a considerable number of our cotton manufacturers if this cotton famine continues. For it has been indisputably asserted, that whilst in 1860, which was the most prosperous year the cotton trade ever knew, not less than 40 millions of pounds sterling were distributed among the industrial classes of Lancashire engaged in the cotton trade or the houses dependent on it, during the last three years, taking every favourable circumstance into consideration, upon the average scarcely twenty-five millions have been realized. The question, therefore, at the present moment, to be considered, is, and it is one of a momentous character, how is this deficiency to be borne if it should be continuous, and by what means is the country to sustain and meet it?

THE SILK TRADE.

I am informed that the Silk trade, during the whole of last year, has been a very difficult and unprofitable one, particularly to the throwers; and further failures amongst them have taken place. The principal cause of this badness of trade has been the scarcity and the consequent very high price of raw silk. The dearness of money had also, no doubt, a very prejudicial effect upon it. With respect to the scarcity of silk, several untoward events have combined, as I am informed, to produce it:

1st. The devastations committed by the Taepings in the silk districts of China, which reduced the exports from that country to something like one half of the actual quantity:
2rd. The almost entire failure of the European crop:
3rd. The partial failure of the Bengal crop:

4th. The temporary suspension of the silk trade with Japan, owing to the Japanese authorities having for a long time prevented any silk from reaching the foreign traders.

The prospects for the present year are also said not to be good. There is a vast falling off in the exports from China, upon even the limited shipments of the same date last year. Still the quantity of new silk obtained from China is expected to increase; but it must be some years before the silk-producing districts recover from the devastations which have destroyed not only the silkworm but the mulberry trees.

We may derive some satisfaction, however, from thus knowing the causes of the depressed condition of this branch of trade; because, we need not then be any more afraid that "there will never be a time again when Coventry, Macclesfield, and Congleton will be full of their ancient industries."

With respect to Coventry more particularly, there is, no doubt, very great depression in the ribbon trade, and that the average rate of wages per week does not exceed 15*s*.; whilst there are a great many people out of employment. It is, therefore, very difficult at present to say anything with certainty about it beyond this, that the leading men of the city venture to speak hopefully of its future condition. Some of them wish that 1865 may be as profitable as 1864 or 1863.

Manufacturers and buyers have both, I believe, been a little over-cautious of late in their operations, on account of the unusually high price of the raw material, the consequent probability of its falling suddenly, and the very unsatisfactory state of things which the buyers experienced last summer. But still it is thought by some that the ribbon trade is, at the present time, on a much sounder footing than it has been for many years. Credit is very much restricted, and but few goods are made to order. Certainly, if a diminution of the number of what may be called large manufacturers contributes to soundness of footing, then there can be no doubt that Coventry is very much improved in this respect; for 10 years ago there were in Coventry 80 large manufacturers in the ribbon trade, and now it is doubtful whether they number 20. Any alteration in taste, which would render ribbons fashionable, would make labour immediately very scarce, and steam power would be brought into general use again. This power within the last two years has been largely disconnected from the machinery of the silk factories, but the occupiers have retained the means of readopting it at a moment's notice.

To have had to contend with three such difficulties, as a change of fashion, a scarcity of raw material, and two wars among customers, and to have lived through them, is, no doubt, hopeful, and gives us a just expectation of something like a renewal of the silk trade by and by.

In the meanwhile other businesses have been established in Coventry, not only to employ some of those workpeople who are temporarily idle, but to enlarge the scope of employment generally within the city, so as to prevent in future, if possible, the danger of such sudden and severe depressions as those through which the silk trade has lately passed. Elastic weaving and worsted weaving may be mentioned as successful instances. But, though successful, one cannot but regard them as failures, so far as the object is concerned for which they were established, and lament the want of enterprise or means which has prohibited their imitation. If Coventry is henceforth to rest content with the history of the past, or is unable to rise to the importance of a manufacturing town again, then all that has been done for it within the last four years to assist part of its population to emigrate, and to sustain the rest till the advent of a restored fashion, is all that may be expected for it. Since it cannot, I presume, be anticipated, that the capital of philanthropists merely, will continue to be expended on experiments, with which, for the sake of dividends, they had no occasion to trouble themselves, when these experiments, though shown to be successful, have stimulated no indigenous zeal to imitate them.

THE FLAX TRADE.

The Flax trade (and it is mainly of Ireland that I speak), has been prosperous through the year of 1864.

Mr. Darkin, Sub-Inspector for the North of Ireland, writing to me at the commencement of this year, states, "Notwithstanding some manufacturers complain of the "high price of yarn, and are apprehensive lest Ame-"rican affairs should produce a panic, I am assured by "competent judges that the trade is in a very healthy "state, and that the stocks on hand are very small, though "the number of power-looms is increasing daily. The "stocks of yarns are still smaller; in fact the spindles "generally are working to order, and every available "spindle is in full operation. In some mills the product "has been increased by the substitution of new for old "machinery. In many factories, great additions to it have "been made, or are still making, and several new mills are

" in course of erection. Though the prices of yarn are not " not now so unnaturally elevated as they were a few " months ago, they are still highly remunerative."

Mr. Girardot, Sub-Inspector for the South of Ireland, writing at the same date of the Southern countries, says, " There is a very great increase in the growth of flax, and " scutching mills are established in almost every town. " Several large spinning mills have been built last year; one " at Cork, one at Carrick-on-Suir, one at Clonmell, one " (cotton) building at Drogheda; and I hear there is to be one " in Dublin. There is a great improvement in the machinery " also in the woollen mills. Nevertheless, considering the " great advantages which Ireland enjoys in water power " and cheap labour, it is a matter of wonder to every one " that there is not more enterprise. A woman of 18 years " of age and upwards, for ordinary work in a woollen mill, " only gets 4*s.* a-week. Coals are also to be had very " little dearer on the coast, than in many parts of England, " 14*s.* in Dublin for example, for the best house coal, so that " steam power could be well used, and yet produce as cheaply " as in England."

The general view of the state of trade thus expressed by the two Sub-Inspectors for Ireland is confirmed in the resumé of trade operations for the year in the "Belfast Northern Whig," of January 2 of this year, as shown by the following extract:—

"The linen trade has enjoyed even greater prosperity in 1864 than in the previous years; and the staple trade of Ulster has never entered on any year with brighter prospects than those with which 1865 now opens. New mills and factories are springing up on all sides; while, as fast as they can be got started, orders flow in, and such a thing as manufacturing for stock is almost unknown. Large profits, owing to shortness of production, are easily obtainable, and a decided increase of capital in the hands of our manufacturers is already apparent. In any case where stocks may accumulate it is owing merely to the indolence of the manufacturers themselves, and their unconquerable disinclination to keep pace with the times, and alter their production from an article which may be gone out of use to one in demand.

"The principle of joint-stock companies has, during the past year, made its first essay in the linen trade. One of the largest concerns in Belfast has been bought by a company, and, though nothing can be certainly stated as to the success of the enterprise till at least one balance-sheet has been shown, we understand the profits will reach what was anticipated, and that the shareholders will have no cause to be dissatisfied. Another company, on the limited liability principle, is also in course of formation, and we confidently anticipate that the working of these trial concerns will be such as to draw greater capital to our town, and ensure the extension and continued prosperity of our linen trade.

" The year 1864 has been characterized by an absence of the speculation which prevailed in the years 1862 and 1863. Prices have ruled high, and, with the exception of the October panic, there have been no fluctuations of sufficient extent to warrant speculation. The good effects of this have been very appreciable. and our merchants have been enabled to conduct their business with more certainty and steadiness than for two years past. All are well aware of the great change which will, no doubt, come, if even for only a short time, when the cessation of the American war shall affect the cotton market ; and stocks are kept as low as possible in consequence. But, as the end still seems far off, prices are regulated by the demand alone, and business is conducted on a comparatively sound basis.

" With regard to the future, on all sides the greatest hopefulness prevails. Though new spindles are being started almost daily, prices of yarns continue remunerative to the spinner to a degree until lately unknown ; while even at extreme rates of yarns, manufacturers are also realising unprecedented profits, owing to the excess of demand for cloth. Our trade with the States is not at present so good, but the West Indian demand has greatly increased ; while linens are being introduced into the East in greatly increased quantities. In the home markets, an active spring trade is anticipated, and the opinion is almost general that, unless a decided fall in cotton, or rise in the value of money, takes place, our trade in 1865 will be more prosperous still, and prices experience a considerable advance.

" The following are the exports for the first eleven months of the past three years :—

	1862.	1863.	1864.
Linen yarns -	£1,707,000	£2,277,000	£2,822,000
Linen manufactures	4,585,000	5,807,000	7,505,000
Total -	£6,292,000	£8,084,000	£10,327,000

With respect to flax, the agricultural statistics of Mr. Donelly for Ireland, which ought to put us to shame in this country, where we have none, or, if any at all, comparatively few, show that 302,000 acres were sown in Ireland in 1864, against 150,000 in 1862. And if we look at this large increase of cultivation by the Irish farmer of a product so essentially profitable to the agriculturist and of such great commercial value to the country, we have an *à priori* reason for an effort on the part of the English farmer to substitute flax for wheat in experimental crops, at all events, until he finds from practical experience whether it is so mischievous to the land as report asserts it to be. It is true that flax has been lower and less profitable to the Irish farmer this year than during the last year, and the result of his enterprise will not be therefore so satisfactory to him in a pecuniary point of view. But this circumstance arises mainly from seasonal causes, and not from any diminished demand or diminished unwillingness on the part of the trade to buy flax. For this country, what is most particularly required to induce flax cultivation is the power of bringing the product to market; and it will probably be in vain that prizes are offered for the best specimens, or leases abrogated which forbid its growth, until the means are attained by which it can be prepared like any other product, for any market willing to receive it. To the English farmer this hint, however, may be of some value, namely, that the total acreage of flax grown in 1864 is likely to be insufficient for the wants of the consumers in 1865, notwithstanding an average import; and the demand is certain to be greater in consequence of the increase of machinery and the new markets in which linen may be in request. It will have been seen from the letter of Mr. Girardot in this Report, that in most of the important market towns in the southern parts of Ireland scutching mills are being erected for the purpose, as has been intimated, of more readily and economically converting the produce into money. And as I have alluded to the want of similar establishments in English counties where flax would grow well, but where the distance from such mills or from other modern appliances for scutching renders it difficult of vendition, it may not be out of place that I should give an idea of what might easily be done by an agricultural joint stock company here and there established, what capital such companies would require, and what return might reasonably be expected from them for the shareholders. It is well known to most persons interested in the flax trade, that the process of scutching has hitherto been conducted in a very crude and inefficient manner; and that there has been an immense annual loss of material sustained in consequence, both by the farmer and the flax spinner. Neither can there be any doubt, that if capital and intelligence were applied to the business, exceedingly important and beneficial results would be obtained. This would be readily accomplished by the establishment of small scutching mills in various parts of this country, as is now done in Ireland, to which the flax could be brought when retted; by the diffusion of useful knowledge on the best means of selecting seed, of preparing the soil, of pulling the fibre, and of retting it more readily; or by offering prizes for the best locomotive machinery, by which, scutching could be added to the thrashing machine.

The cost of such a mill need not, I believe, exceed the following sums:—

	£
Buildings, including water wheel or steam engine with gearing and shafting	1,500
Scutching machinery	1,300
For cleaning machinery	500
	3,300
Capital required to work the establishment	1,720
	£5,020

Estimated result of one year's working, suppose flax to be grown to supply the machinery:—

		£
Receipts for scutching 40,000 stones of flax, at 1*s.* per stone		2,000
Ditto from sale of clean tow, 900 tons at 20*l.* per ton	£18,000	3,600
Cost of rough tow, say 1,800 tons, at 8*l.* per ton	14,400	
Total net receipts		£5,600
Expenses:—		
Wages; 20 women at 1*s.*, 2 boys at 1*s.*, and 20 men at 2*s.* 6*d.* per day	£ 1,275	
Manager and clerks	400	
Rent, taxes, and insurance	250	
Wear and tear on buildings and machinery, at 10°/$_o$ per annum	328	
Interest on outlay, 5,000*l.* at 8°/$_o$ per annum	400	
Sundries for contingents	347	
		£3,000
Net profits equal to 52°/$_o$ on outlay		£2,600

These profits exceed many which have been announced by joint stock companies during the past year; and allowing for a large discount, are sufficient to induce confidence in the experiment.

The importance of the Flax trade to this country, whether in a commercial point of view, or with reference to the employment of the workpeople, can scarcely, I think, be over-rated, especially at this crisis, when no one can foresee the return of that supply of cotton which is still most desired by the manufacturers. And I repeat my convictions, therefore, not only of the desirableness, but of the value of a flax product to the English farmer and the general consumer. As it appears to me, there is but one main circumstance which stands in the way of an immense demand for linen goods; and the bringing that demand into instant action, is in the hands of those who may at any moment accomplish it. The time was when linen was worn in England almost exclusively. It has been superseded by cotton for many years now, not only because of cotton being cheaper, but because of its being said to be a more comfortable wear. In point of cheapness, at the present moment there is nothing to be said in favour of cotton, even with all the disadvantages under which linen labours; in point of service and appearance, the comparison is greatly in favour of linen. It is a curious circumstance, but it is nevertheless a fact, that not long ago, with respect to one class of goods, all the efforts of certain cotton manufacturers were directed to "get up" cotton so closely to resemble linen, that the purchaser's eye should be deceived by it, or else, by showing its capability to receive so fine a manipulation, its apparent value should be enhanced. At the present time, the same efforts are being made to give to linen all the external qualifications of the finest calico, so that it may force its way into the market as a substitute, to a certain extent, for it. "Travelling lately," writes Mr. Darkin in October last, "with Mr. ——, of ——,
" he stated to me some facts which you may like to hear. He
" had just returned from Manchester, where a large exporter
" told him that he was so disgusted with the complaints from
" all quarters of the rotten calico made from Surat cotton,
" that he was determined, if possible, to substitute linen for
" it. He was paying 6$\frac{1}{17}$*d.* per yard for the calico, but would
" pay more for linen. Mr.—— showed him specimens of linen,
" creamed in yarn before being woven into cloth; and he was
" so pleased with the colour and strength, that he at once
" gave an order for 2,000 pieces for export, at 7*d.* per yard
" He further told me that he might have had orders for
" 100,000 pieces, if he could have executed them, so
" pleased was the Manchester man with them. A clever
" girl, minding two looms, has turned out 550 yards of

"this linen in a week." But where the extension of the linen trade fails, is in the fact, that the whole force of the linen manufacturer has been for some time expended on production, whilst he has overlooked the necessity of combining with that the science of distribution. The profit demanded upon calico, bears no proportion to that which the public pays upon linen goods to the retail vendor, above the wholesale price. Thus linen remains still the luxury which it has been ever since it was superseded by cotton, whilst cotton remains what is termed "the leading article." But, with the price of linen as it now stands, with the facility of transport by railway or steamboat, with the competition which is springing up in other countries where they see no disadvantage in growing flax, but are actually increasing their machinery because of the cheapness of labour and the valuable nature of their water power, the time appears to me not far distant, when our manufacturers will have to recast the scheme by which their linens remain unsold, and thereby afford to the public, the opportunity of purchasing linens at such prices, as will leave ample profit to the producers, and at the same time vastly increase its consumption in the most rational way. Our working classes are, at present, almost debarred the use of linen by its enormous retail price; but by and by this anomaly will cease to exist, and linen will take its place by the side of cotton, without entering into injurious competition with it. But though the flax trade in the past year may have been prosperous, yet it has not been as satisfactory as was anticipated of it when the year began, owing to monetary and seasonal causes, over which the manufacturers had no control. I am informed too, that this dissatisfaction would have been greater, but for the exceptionally large crop of flax grown in Ireland and on the continent. Although the quality of the crop has been indifferent, the quantity has been large, and consequently the price has been low; so, at least, says my informant, to whom I am indebted for many of the foregoing and of the subsequent remarks on the subject. The produce per acre in Ireland has been considerably above an average in quantity, though below an average in quality. At the same time, the produce per acre has been much less than in 1863, which was the most productive year on record. The crop of 1863 was estimated at 6 cwts. per statute acre; and this estimate has been fully borne out. As the result of careful inquiry, the crop of 1864 is estimated at 5 cwts. per acre, which is nevertheless 10 per cent. above the average of the seven years ending with 1862. Owing to the large acreage sown, and the poor quality of the flax, the prices of low medium well scutched, and all kinds of hard-scutched flax are very low, at least 25 per cent. lower than at the same period last year,—lower, in fact, than they have been since 1850. This, of course, has been of great temporary advantage to the trade; but there can be little doubt that in the end it will operate injuriously. Our farmers almost always allow themselves to be guided in the crops they cultivate by the prices of the preceding year, and not by the average price of a number of years; and I feel confident, from what I know of them, that there will be a considerable diminution, perhaps equal to a third, in the number of acres sown in 1865, compared with last year. Should this estimate be found correct, the prices of flax must advance to very high figures.

The production of flax for present use may be estimated as follows:—

Crop of 1863 in Ireland	214,092 acres,	at 6 cwt. per acre	54,227 tons.
„ 1864	301,942 „	5 „ „	75,485 „
Total 2 years	516,034 „		139,712 „
Average per annum, for the 2 years	258,017 „		69,856 „

During the same period the imports into the United Kingdom have been:—

1863 - - - -	72,948 tons.
11th May to 30th Nov. 1864, 83,844 tons; add one eleventh part for Dec. 1864, and the imports for that year would appear to be - -	91,406 „
Total imports for the two years	164,416 „

Total home production and imports for the two years, 304,126 tons, or 152,063 tons per annum.

This is an increase on the average quantity available for consumption annually, for the seven years ending 1862, of about 47,000 tons per annum.

The means of consumption in this country have, however, increased in a somewhat similar ratio, whilst in others it is progressing with still greater rapidity. In 1863, the consumption of flax in the United Kingdom amounted to about 100,400 tons annually. At that period the number of spindles in the United Kingdom amounted to 1,216,674: The consumption, therefore, may be estimated, so far as Ireland may be taken as an example, as follows:—

There were working in Ireland in May 1864 - - -	665,442 spindles.
And the Belfast Linen Trade have since ascertained that the number of spindles additionally working since then amount to - -	50,638
And that mills are about to be erected capable of containing -	45,000 more.
So that, by the close of 1864, there may be in all - - -	761,060 spindles working in Ireland.

If then there is an equivalent increase in England, Wales, and Scotland, in addition to the increased consumption by the coarseness of the yarns which have been in demand during the last two years, the average consumption of flax for 1865 will be as follows:—

ESTIMATED INCREASE OF SPINDLES.

	Tons.
England and Wales, 440,000 spindles, at 1½ tons per 1,000 spindles, 50 weeks, at 660 tons weekly -	3,300
Scotland, 357,000 spindles, at 3½ tons per 1,000 spindles, 50 weeks at 1,249½ tons weekly -	62,475
Ireland, 761,000 spindles, at 1½ tons per 1,000 spindles, 50 weeks, at 1,141½ tons weekly -	57,075
Total spindles, 1,558,000 - -	Tons 152,550

being fully equal to our own home production and imports in 1864; whilst there may be a deficiency in the Irish crop of one-third, or 25,000 tons, which would amount nearly to a flax famine.

But more than this has to be considered. I have been favoured with the following table of the flax-spinning mills of other countries, and the increases in the spindles. These are something extraordinary.

LIST of SPINNING MILLS, with an approximate number of Spindles, in the following Countries.

Country.	Number of Mills.	Number of spindles at work.	Number of spindles ordered.	Number of spindles projected.	Number of spindles about ten years ago.
Bohemia - - -	34	137,900	72,700	4,000	33,000
Moravia - - -	21	47,300	58,416	3,800	20,000
Prussia - -	22	133,800	38,200	8,300	47,000
Saxony - - -	5	15,000	9,200	6,000	4,000
Over Austria - -	1	7,000	3,000	—	—
Hanover - -	3	8,000	—	—	—
Bavaria - - -	4	10,200	—	—	2,000
Poland - - -	1	4,000	—	6,000	—
Switzerland - - -	3	5,000	—	—	3,500
	94	368,200	181,516	28,100	109,500

So that when the spindles that are ordered, and those which are projected, are at work, in these countries alone, independently of France, Belgium, Russia, and Italy, flax spinning will have increased 426 per cent. within a single decade; whilst between 1851 and 1861, including spindles for jute and hemp, our own increase for the United Kingdom was not quite 31 per cent. But to this apparent increase of other countries, we must add the increase of spindles in France; and I regret that I cannot, for want of information, give those for Russia, Belgium, and Italy. In 1844 France employed 120,000 spinning spindles; in 1864, she had 563,000; and by the end of 1865, this number is expected to be increased from 650 to 680,000 or, if the latter number, by 470 per cent. in ten years. We may thus foreshadow, as it were, the necessity for a larger home growth of this raw material, if we wish to keep our place in competition with the flax-spinning mills of the world.

NEW WORKS.

The following works have been brought under the Factory Act Extension Act since the date of my last Report.

1. Earthenware works, including china, earthenware, stoneware, crucibles, retorts, casting pots, terra-cotta, chimney pots, tobacco pipes, and ornamental tiles, ridge, plain and encaustic, wares for medicinal purposes, toy

wares, and closet wares. Drain pipes, and sewage pipes were also included, but have been withdrawn by your directions.

2. Lucifer match making, including vestas.
3. Percussion caps, including railway signals.
4. Cartridge making.
5. Paper staining.
6. Fustian cutting.

The following works have also been brought under the Bleaching and Dyeing Works Extension Acts, namely,—

Places (warehouses) in which the processes of hanking, lapping, making up and packing, are carried on, excepting where all the persons employed are males over fourteen years of age.

The Pottery districts proper are of considerable extent, and very populous. The total area in acres of Newcastle-under-Lyme, Wolstanton, and Stoke-upon-Trent, over which this population lies scattered, appears to be 50,887; the inhabited houses in 1861 were 29,707, occupied by 75,806 males and 74,425 females; altogether 150,231, or 5 to a house.

The places more familiarly known as "the Potteries," are Tunstall, Burslem, Hanley, Shelton, Penkhull with Boothen, Lane End, Longton, Fenton, Sneyd, and Rushton; and they extend into three parishes, namely, Wolstanton, Burslem, and Stoke, which latter embraces the principal part of the whole number of places.

For my present purpose I am desirous of separating the Potteries into the five subdivisions for which I have appointed surgeons; *i.e.* Tunstall, Burslem, Hanley, Stoke, and Longton, and their adjacent neighbourhoods, their average inhabited houses and population being in 1861 as follows:

	Acres.	Houses.			Population.		
		Inhabited	Un-inhabited	Building.	Males.	Females.	Total.
Tunstall -	800	2,086	118	9	5,792	5,415	11,207
Burslem -	1,450	4,385	174	38	11,089	11,238	22,327
Hanley -	1,530	6,549	195	52	16,611	16,405	33,009
Stoke -	1,620	3,813	191	44	9,612	9,670	19,472
Longton -	800	3,308	68	65	8,303	8,554	16,857

because, it is with these subdivisions that I shall have mainly to deal in the following observations.

The Factory Acts Extension Act received the Royal assent on the 26th July 1864; and after assisting to prepare the necessary abstracts for your approval, on the 16th of August I went to the Potteries, having taken a residence there for a few months, under the conviction that, after all that had been previously advanced by the advocates for the Factory Act, or for the Mining Act, or for no Act at all, and after the final adoption of the Factory Act with such modifications as would provide for a gradual introduction of its clauses, if I wished to make it a success, it would be needful that, for a while I should live there. Because, first of all, I had to endeavour thoroughly to understand the Pottery system myself; and, secondly, it seemed essential I should be present, with the authority of my office and experience, personally to reply to questions put by anxious enquirers with respect to the anticipated interferences with a hitherto unrestricted labour, to allay fears, to suggest improvements, and to bring about conformity with the law by a gradual introduction of its provisions. Thus I hoped, neither, on the one hand, to re-excite prejudices, nor, on the other, to compel pecuniary sacrifices which were unessential to the protection of labour, to the education of the young, or to the measures of ventilation and cleanliness in the places of work; and yet to adopt the most likely means of eradicating, or at least of materially diminishing, the diseases incident to a potter's life. On the 17th of August I called on Mr. Hollins, the senior partner of the house of Minton & Co., and the president of the Chamber of Commerce, who with the utmost courtesy, went into the consideration with me, of the readiest mode by which I could convey my mission to the master potters, and suggested that we should at once see the Secretary of the Chamber, because the Chamber being composed of master potters, that circumstance alone, would afford me an excellent opportunity of explaining anything which it might be thought desirable to ask me. This interview with the Secretary terminated in a meeting, not only of the Chamber, but of the master potters as a body, to which I was invited, and which was largely attended, and was in every way satisfactory. The result thereof I have previously had the honour to communicate to you.

From the 16th of August to the 15th of December, with the exception of two or three days now and then, I was resident in the Potteries. visiting most of the "Banks," endeavouring to understand the points on which the Act was likely to be brought to bear, making myself familiar with every standard of excellence in the construction of premises, stoves, yards, offices, ventilation, and cleanliness, the social or improvident habits of the people, the amount of school accommodation to be obtained, and the readiness with which it might be adopted if needful. And it was well for me that I was able to argue from the past; for with both masters and men, I met again with precisely similar observations to those I had had to combat in the textile districts, thirty years before. I might, indeed, have been talking again with the same generation. Every old argument, about the "Act not being suitable to the trade," of "there not being "children enough in the district for two sets," of "the "difficulty of schooling those that would be employed on "account of their dresses," and of "the loss of wages by "full time reduced to half time," was repeated again and again.

The habitual drunkard, I was told, laughed at the idea of being coerced into temperance by the force of circumstances. Many of the masters, helpless in discipline, and defenceless as to control over their works, because but a few years ago they were potters at the bench themselves, and had not yet learnt the position into which their enterprise and prudence had lifted them, shook their heads, and "hoped that the "strong hand that had been so long wanted had come at "last." With a few among them, the Act was barely an idea, the benefit of which they were unable to appreciate. They found it difficult to comprehend that educated workers could be of more value to them than uneducated ones. And as to the workmen, some of them saw in the slightly advanced rate of wages which they were sure, they said, they should have to pay for older hands, only a scourge to inflict injury on their own families. Neither were they able to understand that education gives the best chances to ability, but that education cannot be obtained without leisure. There were, however, many, on the contrary, who fully appreciated the benefits which the Factory Acts are calculated to bestow. They could see the advantages which a sober and well-regulated workpeople confer upon society. They could see how baneful it was, both in itself and by example, for skilled hands, because they were skilled, to run riot every Monday and late into Tuesday, stopping all consecutive work to theirs, wasting the time and money of their fellow workers in the most unjustifiable manner, and presenting what was far worse, a temptation and an example to others which was too often irresistible; and they were satisfied to wait the result, and to give to me every assistance in their power

The Potteries Proper, and their Population.

The population of the Potteries proper at various decennial periods has been as follows:—

——	1811.	1821.	1831.	1841.	1851.	1861.
Hanley and Shelton -	9,968	12,947	16,358	20,564	25,369	33,009
Burslem, Rushton, Sneyd, and Hulton	8,625	10,176	12,714	16,091	19,725	22,327
Stoke and the Two Fentons - -	6,687	8,161	9,998	14,353	15,416	19,272
Longton and Lane End - -	4,976	7,152	9,673	12,435	15,262	16,851
Tunstall - -	1,677	2,622	3,673	6,978	9,566	11,207
Total - -	31,933	41,058	52,446	70,421	85,338	102,666
Increase -	—	28 p. ct.	27 p. ct.	34 p. ct.	21 p. ct.	20 p. ct.

I find also by the Census Returns of 1861 that there were employed in the manufacture of earthenware, in the whole county of Stafford, which virtually means "The Potteries," 17,356 males, and 10,075 females = 27,431, at the following ages:—

Males.

At 5 years.	10	15	20	25	35	45	55	65	75	85 and upwds.
434	2,758	2,921	2,562	3,604	2,614	1,495	731	194	37	5

Females.

At 5 years.	10	15	20	25	35	45	55	65	75	85
159	1,847	2,639	1,922	1,705	944	532	231	79	14	

So that, less than four, years ago, there were to be found working in the Potteries, some of which I shall hereafter have to describe, and for the hours of work, of which I shall have to speak, out of an aggregate number of both sexes of 27,432 not fewer than 593 little children of five years old, of whom 159 were females; nor less than 4,605 other children of between five years old and ten, making altogether under ten years old an aggregate number of 5,918 persons, of whom 2,917 were females.

In looking at the form and the helplessness of a child of five years old, one's own child for example, it is scarcely to be believed that such a state of things could ever have existed, and especially when the average wages of potters is taken into account. But these figures are not of my collecting. I have, it is true, seen children of five years old at work; once in the textile districts and now again in the Potteries, and once again very recently in a brickfield. And I have seen a good many children lately who were five when they first commenced to work, though they are eight now. But the above are census enumerations, and were taken from house to house; and it is my pleasure and my privilege to add, that they tell a tale, of which the happiest part is, that it can be told no longer. But they fully bear out the statements made by the master potters in their memorial to Her Majesty's Government,—

"1. That children are employed in the Potteries at a very early age, and in a way to interfere injuriously with their education; and

"2. That this state of things is the cause of various moral and physical evils to the youthful population of this district."

THE DIFFERENT BRANCHES OF POTTERY EMPLOYMENT.

The divisional employment of potters is a matter of interest in many points of view; but more particularly for the purpose of enquiring into those parts of it which are said to be not only prejudicial to health and morals, but to life itself. With this idea, I endeavoured at the outset to obtain a correct analysis of all the branches of labour in earthenware manufacture, and the number of persons employed in each branch, in the form adopted under the Factory Act, namely, of adults, young persons between 13 and 18 years of age, and of children under 13 in each district separately. This analysis is so approximate to the census returns, being only in excess of them by 456 persons, that there can be no doubt of its accuracy. This excess may partially be accounted for by the difference between the periods in which the returns were taken, and partly by a number enumerated in my returns, which are not placed amongst "manufacturers of earthenware" in the census returns. We are thus enabled not only to apply remedial measures in the right direction, but to separate the remainder of the departments from those which are deleterious, so as to relieve by far the largest portion from a correlative imputation which they do not deserve.

The following tables are the result of this inquiry. Had I been more competent, I might perhaps have grouped them more effectively. As they stand, they will give a clue to many important questions, which it is not my province to consider, and which I do not therefore enter upon.

It has been seen that in 1861 the census number of persons engaged in the manufacture in the whole county of Stafford was 27,432. My returns make it at the present moment in the Potteries proper 27,878, sub-divided as follows in the various towns:—

—	Adults.		Young Persons.		Children.		Total.		Together.
	M.	F.	M.	F.	M.	F.	M.	F.	
In the Hanley District - -	2,949	1,308	921	601	548	331	4,418	2,240	6,658
,, Burslem do.	2,649	1,305	852	562	558	344	4,059	2,211	6,270
,, Stoke do.	1,992	1,267	519	421	413	165	2,924	1,853	4,777
,, Longton do.	2,335	1,875	847	819	521	444	3,703	3,138	6,841
,, Tunstall do.	1,398	577	422	346	356	233	2,176	1,156	3,332
	11,323	6,332	3,561	2,749	2,396	1,517	17,280	10,598	27,878
The same figures for 1861 being -	11,242	5,431	2,921	2,639	3,192	2,006	17,355	10,076	27,431

Description of Workers.	Hanley.						Burslem.						Stoke.						Longton.						Tunstall.						Total.	
	Adults.		Young Persons.		Children.		Adults.		Young Persons.		Children.		Adults.		Young Persons.		Children.		Adults.		Young Persons.		Children.		Adults.		Young Persons.		Children.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F	M.	F.
Hollow-ware pressers. including all branches	609	3	162	–	10	–	432	2	119	2	1	–	241	1	67	–	3	–	284	1	128	2	19	–	209	–	84	–	6	–	2374	11
Flat-pressers, including all branches	237	1	257	16	387	74	207	3	303	34	439	86	135	–	127	8	268	12	257	6	247	36	384	27	149	14	144	97	287	86	3828	500
Throwers, including all branches	63	55	10	7	3	–	121	101	16	12	2	4	44	50	13	14	6	1	136	156	17	25	2	4	41	40	8	8	2	1	484	478
Turners and attendants	89	30	17	15	5	–	123	91	28	19	–	6	78	54	17	14	–	2	190	153	33	29	–	3	47	39	11	5	–	3	638	463
Handlers and handle makers	62	30	16	13	11	10	74	4	32	1	20	1	47	12	7	4	17	4	67	131	15	57	6	38	45	–	17	–	23	1	459	306
Cup, bowl, dish, and basin makers	95	1	9	–	1	–	223	8	16	5	6	2	87	–	12	–	15	–	75	1	6	3	–	–	91	2	7	2	2	–	645	24
Mould makers	76	–	6	–	2	–	55	–	2	–	–	–	42	–	6	–	4	–	56	–	–	–	–	–	26	–	5	–	2	–	282	–
Slip makers	144	–	7	–	2	–	146	–	1	–	1	–	99	–	7	–	1	–	119	–	7	–	–	–	83	–	1	–	–	–	618	–
Sagger makers	89	–	16	–	–	–	86	–	21	–	2	–	66	–	15	–	4	–	83	–	16	–	2	1	52	–	17	–	–	–	469	1
Engravers	19	–	2	–	–	–	16	–	1	–	–	–	20	–	1	–	–	–	4	–	–	–	1	–	9	–	–	–	–	–	73	–
Dippers and assistants	60	2	86	–	22	2	76	9	92	5	17	2	37	2	36	–	16	–	70	7	51	–	22	1	32	5	44	4	15	–	676	39
Dipping house-ware cleaners	5	48	1	14	–	–	1	59	2	11	3	5	2	24	1	1	1	1	14	14	13	4	2	–	1	14	2	14	–	1	48	210
Placers and oven lads	341	–	47	–	11	–	323	–	37	–	2	–	243	–	43	–	3	–	279	–	49	–	9	–	220	–	26	–	2	–	1638	–
Firemen	82	–	1	–	–	–	80	–	2	–	–	–	45	–	3	–	–	–	95	–	7	–	1	–	37	–	1	–	–	–	354	–
Kilnmen	55	–	17	–	1	–	42	–	11	–	1	–	34	–	10	–	1	–	78	–	8	–	3	–	22	–	1	–	–	–	284	–
Warehouse workers	141	229	80	72	37	18	113	214	45	124	32	34	111	145	54	23	19	13	48	159	50	44	10	14	55	87	20	63	7	16	821	1255
Burnishers	14	125	7	114	1	19	1	103	–	51	1	13	–	95	–	52	–	4	6	277	–	173	–	70	1	21	–	6	–	3	31	1126
Packers and assistants	72	–	43	–	3	–	72	–	45	–	5	–	49	–	11	–	7	–	82	–	25	–	4	–	40	–	22	–	5	–	485	–
Printers, transferrers, and paper cutters	168	240	4	153	5	91	185	264	9	143	–	121	89	161	–	78	–	69	177	234	2	160	5	114	107	148	–	71	4	94	755	2144
Gilders	95	21	47	5	1	5	88	16	51	–	3	–	113	52	3	6	–	–	55	232	132	60	8	9	16	–	–	–	–	–	612	406
Enamel painters	17	304	4	138	8	92	1	207	–	122	4	53	–	444	–	138	–	16	6	281	–	135	1	113	–	64	–	53	–	24	41	2184
Biscuit painters	21	102	9	27	14	15	12	132	1	24	–	9	73	91	13	31	–	22	22	111	5	80	6	40	–	86	–	18	–	2	176	790
Ground layers	13	9	–	2	–	–	15	–	–	–	–	–	11	–	–	–	–	–	20	5	–	–	–	1	3	1	–	–	–	–	62	18
Stencillers	1	26	–	1	–	1	3	20	–	–	–	–	1	23	–	–	–	–	–	3	–	–	–	–	1	3	–	–	–	–	6	77
Stilt makers	3	48	1	9	–	3	1	60	–	6	–	–	8	51	2	31	–	10	2	29	–	3	1	7	–	31	–	2	–	–	18	296
Parian workers	70	2	37	8	12	–	16	2	6	–	12	–	101	15	44	11	35	4	14	8	21	2	25	1	–	2	–	–	–	–	393	55
Modellers	11	7	4	–	1	1	3	1	–	–	–	–	18	–	4	2	–	–	1	–	–	–	–	–	2	–	1	1	1	–	46	12
Scourers	–	6	–	–	–	–	–	1	–	1	–	–	–	22	–	3	–	–	–	45	–	5	–	1	–	9	–	–	–	–	–	93
Colour and gold grinders	1	8	3	–	–	–	–	5	–	1	–	–	–	12	1	1	–	–	–	10	–	1	–	–	–	–	–	–	–	–	5	38
Lusterers	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	2
Flinter	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1
Batt printer	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	1	1	–	1	–	–	–	–	–	–	–	4	1

TABLE of WORKERS in the various Departments of Earthenware Manufacture in the Potteries—*continued.*

Description of Workers.	Hanley.						Burslem.						Stoke.						Longton.						Tunstall.						Total.	
	Adults.		Young Persons.		Children.		Adults.		Young Persons.		Children.		Adults.		Young Persons.		Children.		Adults.		Young Persons.		Children.		Adults.		Young Persons.		Children.			
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Traveller	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4	–
Errand boys	–	–	–	–	–	–	–	–	2	–	2	–	–	–	6	–	–	–	–	–	2	–	3	–	–	–	2	–	–	–	17	–
Cookers to ware	2	3	–	3	–	–	5	–	1	–	–	–	–	–	–	–	–	–	10	–	1	–	1	–	11	3	2	2	–	–	33	11
Carters	22	–	1	–	–	–	11	–	–	–	–	–	13	–	–	–	–	–	26	–	1	–	–	–	2	–	–	–	–	–	76	–
Odd men	152	–	7	–	1	–	60	–	3	–	–	–	74	–	6	–	1	–	18	–	3	–	2	–	60	–	2	–	–	–	385	–
Foremen	28	–	2	–	–	–	8	–	–	–	–	–	30	–	3	–	–	–	26	–	–	–	–	–	15	–	3	–	–	–	115	–
Artist goods makers	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	1	–	4
Joiner and builder	16	–	–	–	–		1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	17	–
Machine men	4	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	7	–
Ware polisher	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Labourers	10	–	3	–	–	–	7	–	4	–	1	–	12	–	1	–	–	–	–	–	–	–	–	–	4	–	–	–	–	–	42	–
Letter makers	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–
Crate makers	–	–	–	–	–	–	16	–	–	–	–	–	21	–	5	–	4		–	–	–	–	–	–	–	–	–	–	–	–	46	–
Enc. tile makers	–	–	–	–	–	–	–	–	–	–	–	–	30	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	30	–
Plain tile makers	–	–	–	–	–	–	–	–	–	–	–	–	13	13	1	4	8	7	–	–	–	–	–	–	–	–	–	–	–	–	22	24
Clay marble maker	–	–	–	–	–	–	1	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	2
Glazers and finishers	–	–	–	–	–	–	4	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	6	–
Clerks	21	–	2	–	–	–	10	–	1	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	15	–	2	–	–	–	52	–
Millers	6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6	–
Edgers	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	2	1	–	–	–	–	–	5	–	–	–	1	2	9
Metal mounters	4	2	–	4	–	–	2	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	6
Metal polishers	–	5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5
China figurers	16	–	12	–	10	–	–	–	–	–	–	–	–	–	–	–	–	–	8	7	7	–	3	–	–	–	–	–	–	–	56	7
Dust pressers	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Engine men	2	–	–	–	–	–	2	–	–	–	–	–	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	–
Lodge keepers	2	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	7	–
Artist	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Puncher	–	–	–	–	–	–	–	–	–	–	3	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	
Plaster boiler maker	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
Die maker	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–
	2915	1308	921	601	548	331	2649	1305	852	562	558	314	1992	1267	519	421	113	165	2335	1875	847	819	521	144	1328	577	422	340	356	233	17280	10598

Before, however, I proceed to speak of the potters generally, permit me to present to you an outline of one of the subdivisions, Longton, which has the reputation of being the worst of all the five, whether for its uncleanly condition, its want of ventilation in its workshops, or as being the most backward in general intelligence; because, a descripton of it as it was and is, its houses, streets, properties, and people, indicates somewhat the state out of which the other towns appear to be gradually rising, and also accounts for much of the architecture of the "Banks" themselves.

For my part, I do not agree with the censure which a comparison with the other Pottery towns attempts to fasten upon Longton. It may be true that earthenware is to be had more cheaply there than elsewhere, and that its master potters are a little nearer the bench than the present generation of manufacturers in Stoke, Hanley, Burslem, and Tunstall; but this I know, that there are "Banks" as bad, and potters as vicious, to be found in any one of these towns, as in Longton; and that many of them are bad enough, and vastly require rectification. Morever, the present commercial status of Longton is but a few years old; and, although a good deal remains to be done in the way of sanitary reforms and intellectual progress, much has been attempted that is eminently praiseworthy. In population it ranks only fourth of the five towns, but in number of "Banks" it precedes them all. For the following information with respect to it, I am indebted to Mr. Palmer, a most intelligent resident in Longton, and my thanks are especially due to him for the great pains and care which he has bestowed upon his communication.

> "In 1817," says he, "the township of Longton and Lane End contained a population of 2,277 males and 2,653 females, making a total of 4,930 inhabitants. The number of families was then 1,079, of houses 1,032; at the present time there are in Longton proper 3,860 properties, 3,606 of which are houses, 62 manufactories, 32 mills and offices, and 140 of a miscellaneous character, owned by 630 proprietors. At a much later period than this, the streets in the town were all unpaved, except two short lengths, which had been paved by the owners of the property. The channels were all open ditches, and many of the roads were in such a condition as to be scarcely passable, the ruts being so deep as to sink a conveyance up to its axle. Indeed, at this point, there were comparatively few portions of the town that arrogated to themselves the title of streets. They were satisfied with the term 'lanes,' characteristic of the locality they described, such as Hog's Lane, Smock Lane, Stir Pudding Row, and Devil's Nook. Street lamps were not even dreamt of. Many of the houses were

extremely rude in their construction, and unevenly built. They were all sorts, sizes and shapes. Scarcely a dozen houses throughout the town were uniform in height, style and frontage. Background and foreground were made to blend in most grotesque confusion. Corners and gables, backs and fronts, all ranged in one street; and in but a few cases, those not unnecessary appendages to every well ordered house, the closet, the pigstye, the coalhole, and the stable, formed the foreground, even to modern Longton, with a dunghill and ashpit to relieve the picture.

"Many of the houses were of very lowly pretensions. A man of six feet in stature could not stand in these domiciles, in an erect position. These cottages were chiefly built of mud and stone, had thatched roofs, and windows and doors of very primitive type. The bed room and living room were both in one, or sometimes divided by a partition wall on the ground floor. The family washing was generally carried on on a kind of stone 'setlass' in front of the house. Nevertheless, these huts were frequently clean and snug, whitewashed within and without, and in them the comforts of life were often realized in a large degree.

"At this time the character of the people, to a great extent, was in harmony with the place. The tastes of the masses were low and brutalizing. The advantages of education were not realized. The prevailing amusements were bull-baiting, bear-baiting, dog-fighting, cock-fights, men fighting and race running; and consequent on these, drunkenness and its attendant vices existed to a large extent.

"On political questions the people were excitable and violent. The creed of the lower classes was rabid chartism; and during elections a most malignant spirit manifested itself. I am proud, however, to say, that chartism is only known as a thing that was. Improved circumstances and better information have wiped out that stain from the character of the town for ever.

"Yet, with all these odious features, there existed the genuine elements of a noble-hearted people, which distinguished themselves in protection to the weak, in a generous hospitality, and the bold espousal of an injured cause; and these only needed judicious guidance to make them things of worth. The good wanted cherishing and training, and the bad weeding out; and in the order of Providence men have sprung up whose object in life has been, gently to remodel the social and moral aspect of the population; and in this great and good work they have been marvellously successful. It is now patent to every observer that a great change for the better has come over the place and the people. The physical aspect of the town has been metamorphosed: and with every public improvement, a beneficial influence has been manifestly exerted upon the people. Their tastes have been elevated, their ambitions excited, and a desire for progress has been infused into their minds. The current of their pleasures has been turned into a proper channel. An onward march has been started in good earnest; and the changes already effected are but the faint foreshadowings of achievements yet to be accomplished.

"Up to the year 1839 the town had no governing body. In that year a special act of parliament was obtained for lighting, watching, and improving the town by commissioners. In 1855 these commissioners adopted the Nuisance Removal Act; and ever since have been most assiduous in the discharge of their duties. Up to June 1864 they have caused the owners of property to enlarge, repair, or erect 695 privies, cesspools, and ashpits; to open, cleanse, relay, or form 207 drains, soughs, or gutters; to remove 111 pigstyes which were too near dwelling-houses; and to carry away 110 manure or other heaps of filth of an offensive or injurious character. They have caused the tenants of various properties in 772 instances to thoroughly cleanse and limewash their premises, and to remove, in 112 cases, pigeons, donkeys, fowls, dogs, and rabbits from the interior of their dwelling-houses. But to thoroughly eradicate existing or sanitary evils a complete system of drainage is essentially requisite. At the present time a very small portion of the town is drained; to meet this want there requires from seven to eight miles of sewerage, which might be completed for about 14,000*l*.

These extracts from Mr. Palmer's report have been selected, as I have before said, with the view of exhibiting to you one of the towns, and, by parity of reasoning, many of the places of work in it, with which I have had to deal in my official capacity. The "Banks" have indeed been formed, in many instances, of old premises, "rude in con-" struction, unevenly built, and of all sorts, sizes, and " shapes, background and foreground blending in grotesque " confusion;" and having been added to from time to time, as the necessity arose for greater accommodation, they now more resemble huge rabbit burrows than manufactories; for they are in and out, up and down, underground and attic, up rickety stairs and down into storage cellars, requiring a firm step and an aptitude to stoop, and a sharp eye to enable one to see "round all corners," for the creatures, young and old, male and female, which are running here and there in every direction. And when I inform you that these banks extend by piecemeal, from a single room to over 15 acres, some idea may be formed of the difficulty of thoroughly inspecting them, and of the many points which have had to be considered, and in every relative point of view, so as to enable me to carry out not only the clauses of the Act which restrict the labour of children and females, but those especial clauses which relate to sanitary requirements, on which legislation has been attempted for the first time.

Of course, "Banks" or parts of "Banks" that have been newly erected, and some of those which have always been occupied by wealthy proprietors, are not included in the description which I have just given. Those that I have referred to are mainly the workshops of men of small capital, who were once, and not long ago, workmen themselves, and who are unable, for want of means, to carry out the improvements in their premises, of which they do not fail to see the advantage and the necessity, as well as anybody else. Moreover, many of these premises are held under leases for terms of years, and the landlords are either too poor to improve them, or are unwilling to keep pace with the times, affirming that, "the old times were the best, and that "what did for them might do well enough for those that "came after them."

There are, however, also, a few better-to-do masters who are either indifferent to the comforts of their workpeople, or too idle to take even the decencies of life into consideration. I believe I speak without exaggeration when I say, that 40 per cent. of all the banks which I have seen, and they have not been a few, were entirely without any accommodation for the female workers, and none that the men could use. Many of the yards too are formed of ashes, and, in consequence of the transit over them of heavy-leaden carts, there are deep ruts formed in them, which hold water after rain, into which the workers are liable to step in dark mornings, and so to remain with wet feet for the whole day. I have also had to complain of defective drainage, of broken windows in the work-rooms, by scores, rendering the workers liable to chest affections of every kind; of dangerous steps for want of handrails, and of many other things which one would have thought the commonest care for their workpeople would have remedied instanter. I will not, however, weary you with more remarks upon these points; I will only make a few remarks from my diary, with reference to two or three of the "banks" which have fallen under my notice.

"The following letter received to-day:—

"'Sir.—I think it a Duity of mine to draw your attention to a great inconvenience, existing in the potters' manufactories generally. i Can assure you there is but very few Factories that as Waterclosets fit for a female to go: and as i Here so Litle mention made, you will excuse me Drawing your attention to the Evil existing.—Yours a working man, [quære woman ?],"

"——— visited Messrs. ——— bank, at ———. Is a most fearful place. One of the partners attended and observed that if they left it, all the old places would fall in, and only the new remain. Here the privies for the men were in a most disgusting state, and there were none for the women. The rooms also were very small, low, and badly ventilated. Heat, 120°. All the roadways were greasy, filthy, and altogether wretched. The excuse here, for this condition of the bank was, as elsewhere, that 'the landlord would do nothing,' and that but for the Act nothing ever would have been done, and the workpeople would have gone on in the same way as long as the places would have held together. Employ upwards of 250 workpeople, of whom 90 are females."

"Visited ———. Very old works. Girls of 16 wedging clay and lifting half a hundredweight at once, every few minutes; complained of being very tired. Wedged all day, and sometimes till 8 o'clock at night. There are many stoves in all. Rooms are very hot. No double doors to stoves. There are a few children under 11 working full time. Courts are not very clean; and some of the rooms appear as if they were about to fall, and have to be sustained with props in various ways. Of 18 girls and boys asked, 12 said, 'they could not read, or could only read a bit.' The sagger-making place was so hot that it burst the bulb of a thermometer marked to 120°. Employ upwards of 100 people."

"Visited the works of ———. Employ upwards of 120 people. Whilst there a workman on the premises, not in working clothes and evidently disposed to be angry, pointed out to me the damp condition of the floor on which the workers stood all day,—he amongst the rest,—owing to a want of drainage in the yard, which was considerably above the floor of the workshop. The flags of the floor were very damp, and some of the workers had provided themselves with timber on which to stand. I also saw at this bank such an utter want of decency and disregard of the comforts of the workpeople as would not be believed were it not to be seen. The entrance to one of the principal workrooms was under a sort of platform, to which there was an ascent by some outside steps of stone, lying parallel with the building, the pillar of those steps forming part of the entrance way. In the recess formed by these steps was a privy, with the door opening into the passage, not four feet wide, by which the people entered into this workroom, so that not only could not decency be observed but privacy was out of the question, and the stench in the room was abominable."

"Visited the bank of ———. The most wretched hole imaginable. There had been heavy rains during the night, and walking in the yard of these works covered the heel with mud three inches high. Many of the workrooms were a step or two below the yard, and having no drainage at the doors, the wet entered into them, and made them exceedingly uncomfortable. Most of the outside steps were without handrails, and were thus exceedingly dangerous when used at night. The workrooms were very hot and comfortless, and had not been whitewashed for years. On asking to see the privies here, I found only one horrible place for all the workers, without any doors, in front of a place of work constantly in use, with the people passing up and down in sight of it in every direction; no accommodation whatever for females. The total number of persons employed being 150."

"Visited ——. Comfortable in many respects. Airy and well whitewashed, but ventilators placed unintentionally directly in front of the faces of the workpeople, by which they suffered severely at times from faceache and toothache. Requested them to be altered, which was immediately promised."

"Visited ——. In these works there is very little left to be desired. They show what can readily be accomplished by a master who requires discipline and enforces it, and who in return for obedience and good will exerts himself for the comfort of his workpeople. The courtyards are all paved, and every room and all the staircases are whitewashed once a year. Great pains have been taken to render the ventilation perfect. The floors also are as clean as they are capable of being kept in such works. Even the outer walls of the buildings within the curtilage are all cleaned once in every year. Nor can it be said that this is a result which is due to new works, for in all the old portions, of which there are several with very low rooms, the same order and cleanliness prevail. In many of the rooms many females, in some, all girls, in others, all women, are at work on the various processes of manufacture ; but there is no loud talking and no disorder, and everywhere there seems, as there is, a discipline which evidences what may be accomplished where there is a will. The ventilation of the rooms is very fair. It is effected by openings to the external air of the size of a brick in the upper part of the walls, near the ceilings, which render the rooms of an agreeable temperature, and the workers look healthy. Most of the persons whom I saw at work were above 13 years old. The total number of persons employed is very large."

"Visited ——, said to be the worst of all the banks in the Potteries, and the facts do not very much belie the statements made against it. Over the whole of the works there was much dirt, endless broken windows, steam from the slip-makers' shop into the shops above through the floor, which yawned with great crevices everywhere, and the conductor, which ought to have carried the steam away, broken to-pieces. Many children were employed here in hovels of every description, and in rooms in which there were stoves at almost every degree of heat, of which rooms the masters did not even profess to know the number, nor the number of his workpeople. There was no paving to the the courts, which in wet weather must have been in a wretched condition, and several of his workpeople were working in rooms built around skeleton hovels, in which the heat in summer time must be intolerable. The stairs and steps of this wretched place were in many instances broken and in holes, and all without bannisters, so that at night and in winter the ascent and descent to the workrooms must be attended with considerable danger. No whitewashing had been ever put on these inside walls or ceiling, nor had the floors been swept apparently for months."

"Visited ——'s place, and was shown over his large works. Saw several children, principally under eleven, employed as mould runners. The works were light and airy, and cleaner than many. They had been regularly whitewashed, and were pretty well ventilated. The stoves were numerous, and some of them as high as 110°."

"Visited ———. Found it an old-fashioned place, of large area, which had once been in active operation, but of late years this had been somewhat diminished. The owner and occupier politely asked me to walk round with him, and invited my opinion on the various alterations which would be required in order to bring these works into full compliance with the law. I pointed out a want of spouts, drains, windows, broken floors, and a vast many other things of like nature, which had either gone to ruin, become stopped up, or had been originally disregarded, which I was afterwards informed had been estimated to cost 600*l*., and was made a source of complaint against the Factory Act; the proprietor forgetting, that this amount only pointed out the extent of his antecedent neglect."

THE POTTER'S EMPLOYMENT.

Its Effect upon Health, with suggested Remedies.

I think there can be no doubt about the potters being physically "a stunted race." Whether this arises from the habits of the people, from their occupations, or from both, the fact, as asserted in the masters' memorial to Government, appears to me to be undeniable. The children, though working all day long in such variable temperatures, and hitherto for such occasional long hours, seem not without energy enough, as you see them playing in the streets at meal times; but their faces are pale and sallow, and their figures display none of those rounded curves by which happy and cared-for childhood is so distinguished. They more resemble, than any other that I have seen, the children of widows in destitute circumstances or Irish children, that are fed upon thin coffee, bread, and herrings. We could, indeed, scarcely expect to find, physiologically, that the children of such sensual parents should be otherwise than stunted, under the circumstances, first, of their peculiar geniture, and, secondly, of a wear and tear which is inconsistent with development. I do not, however, intend to refer to any other of the various branches of this trade, as shown in the preceding tables, than those which are known to be more especially prejudicial to health; since it may be assumed, à priori, that all trades in which long hours of work obtain, are prejudicial to the physical and moral health of those engaged in them.

And, first of all, as to the hours of work. For years these appear to have been most irregular, depending upon the execution of shipping orders; or upon the drunkenness and dissipation of the heads of departments. Working by piecework, and bound to deliver over within so many, days a certain tale of product, the lâches of the early part of the week have had to be thrown over the latter part of it, and all the goods which could not be completed day by day, to be eked out at its close. The peculiarity of a potter's trade, namely, its being composed of consecutive branches, one branch being so thoroughly dependent on another, is unfortunate in this respect; it so easily leads to a derangement of the comforts of the many by the iregularities of the few. A workman, for example, who heads a department, absenting himself on a Monday, or on any other day of the week, stops by that absence all the branches which follow him. Thus, supposing there to be no clay in stock, and the slip makers to absent themselves, all the workers on the "Bank" would be stopped also, and have to sacrifice their wages on their account. On one occasion, I was present when a workman had been newly hired for a year, and deemed that a fitting occasion for a "wetting;" so he left his work at noon, having tempted a second fellow worker with him, and when I was on the "bank" seven others had been awaiting their return for hours, the total loss of wages to these people for that day being about 20s. Under the old regime, these workmen and these workers would have had to make up, by working lateon Thursday and Friday nights, the loss of product occasioned by the escapade of Monday or Tuesday. In other cases, the execution of certain orders within a given time may have induced long hours, especially in certain departments. Some few weeks after the Factory Extension Act was passed, I entered a paintresses' room at 7 o'clock, p.m., and found 16 young girls all at work, which they were prepared to continue to 9 o'clock, "according to orders, as the ware was wanted;" and it was only on my asserting that the masters would be punished if they did, that the work was abandoned. Thus, on another occasion, I detected in the language of a workman that he had a night set as well as a day set, and that, notwithstanding the law, night work was still practised. I felt that this was a case for prosecution, and accordingly the firm was brought before the stipendiary magistrate; but I instructed the sub-inspector to withdraw the case, as it was the first, on condition that the practice should not be continued.

Generally speaking, in the Textile districts there are but few applicants for leave to change the hours of work in the winter months from 6 to 6 till 7 to 7; but in the Potteries this change has been almost universal during this winter. Whether it will be continued or not through another winter is doubtful; for the change disturbs the domestic habits of a family in the morning, and deprives the night schools of occupants in the evening, without adequate compensation. For the first winter it was well enough, but when the workers once become accustomed in the spring and summer mornings to the early rising, which 6 to 6 o'clock enforces, and to the refreshing exercise which may be obtained when work is over, it is probable that they will retain these hours, which the habit will, by that time, have induced them to continue.

The following are the processes which have been said to be unhealthy:—

1. *Slip Making.*

1. By the wet rooms and wet standing places which it occasions; and
2. By the steam which is generated during the process.

The slip maker is a person who prepares the materials for use; and this he does by one of two processes, either by plunging the clay in water with a wooden instrument, till the whole is of the consistence of thick cream, and afterwards boiling it upon a kiln till it is very similar in appearance to glazier's putty; or, by machinery, of which there are but as yet few instances, which, first of all, grinds the flints to powder, then mixes them with water in large troughs to the cream consistence, then strains them through fine gauze, and delivers them eventually to hydraulic presses, by which the same putty consistence is obtained. No doubt the latter process is far more healthy and effective; and time and capital are only required to bring it into general use. It will probably initiate machinery, in the manufacture of earthenware; for when once steam power has been adopted on a Pot "Bank," hydraulic slip making, and machinery generally, will follow as a matter of course. There are 618 slip makers in the potteries, and the average age which they attain, assuming that their occupation is not instrumental to dissipated habits, appears not to exceed 52 years; and it may be justly therefore considered an unhealthy branch. Out of 11 slip makers who died in 1864 three lived to above 60 years of age, and six died of asthma and bronchitis.

2. *Flat Pressers, including Jigger Turners and Mould Runners.*

1. By the heat which the stoves occasion, and from which they are not duly protected in the workrooms.
2. In the operation of jigging.

3. In the operation of mould running.
4. In the operation of wedging clay.

The total number of flat pressers and their attendants appears to be 3,828 males and 500 females, of whom 1,078 males and 191 females are young persons, and 1,765 males and 285 females, children. If we add the young persons and children together we include all the jigger turners and mould runners, and they amount to 3,319, of whom 476 are females. These figures are interesting, for it must be remembered that in 1861 the census returns, which included all that were really working, though perhaps some only occasionally, gave the number of these children at 593 of five years old, and not less than 4,605 as between five and ten years old. It thus appears to be self-evident that, in the selection of the Mining Act as that which was to restrict labour, the maximum physical capability of a child was the object estimated; and that the educational power, or opportunities of the children themselves, were either omitted from the estimate, on the supposition that by the time it was ten years old a child might be sufficiently educated for all its future requirements, or that education in return for an indispensable form of labour was a thing to be disavowed. These figures show, I think, conclusively also, the fallacy of the outcry with respect to the impossibility of obtaining two sets of children for the half-time system. It was asserted broadly by the advocates for the Mining Act, and is now by others who are adverse to the education clauses of the Factory Act, that ten years old was and is the only admissible age for a child to work on an earthenware bank. But if so, then it would seem, by the parents' showing, that of the children employed in such establishments at the time of the census, fully nine-tenths of those who were at that time between five and ten years old, and all those under five years old, would have had to be discharged, and to be replaced by others who were fully ten, exactly doubling the numbers with the reduction of the age to eight years on the half-time principle, and very greatly increasing the cost of production to the workman.

As to the flat pressers alone, it is very difficult from the returns to divide them into adults and adolescents; but at a reasonable estimate, they amount to 1,500, and their employment is doubtless prejudicial in two ways, one of which is due to the kind of labour, the other to moral causes.

1st. By the heat in which they work, and

2d. By the inducement to drunkenness which that heat and habit together, occasion, the former of the two assisting most materially to develope and promote the latter.—

> Of 65 flat pressers who died in 1864, in Longton, Fenton, Hanley, Stoke, and Shelton, 27 died of phthisis, 10 of bronchitis, 4 of asthma, 4 of pneumonia, 3 of apoplexy, 3 of dropsy, and the rest of different ailments; so that of the total 70 per cent. died of diseases of the chest, and the average age of each person did not exceed 41 years.

A more startling confirmation of the evidence given to Mr. Commissioner Longe by Mr. Bilton, the manager of the Copeland Works, could hardly have been contemplated. Mr. Bilton's words are these: "The greatest good the "Legislature could do, if it were possible, would be to "bring about a change in the present system of stoves." And again, "I think the heat of the stoves is the great evil "of the trade. I believe it is the cause of the drinking "habits as well as of the debilitated constitutions which "prevail among potters."

It is not to be anticipated that there would be found a corresponding ratio of deaths among the children as among the adults, even though working within the mischief of the same causes. The seeds are only sown in childhood which require years to mature. But they are sown then, and are as certainly brought to maturity, or we should find the average age of the pottery population much higher than it is.

With respect to the ages at which I have seen children at work, they vary. I have seen two or three at five years old, several at six and seven years, and a great many at between eight and eleven years of age. I have been told by many, that they commenced work when they were only five years old, thus confirming the census returns. Their answers were given, first, as to their ages, then as to the length of time they had been employed altogether. On questioning one little fellow who began to work at that early age, as to the distance he came, I was replied to by another of the same small stature as himself, that when he came to work as a "jigger," he walked a mile and a half each way to work for his brother, when he himself was in petticoats. Another child, who was not yet six years old when I saw him at another bank, informed me that he could not read, that he had been "jigging" for some time, and that he worked the previous night till 8 o'clock p.m. In another instance I was rather struck with the confident tone in which a manufacturer assured me that in his establishment no child under eight years old had ever been employed; when on passing a very small child then at work, I said, "How old are you?" "Going nine, sir," he replied. "Yes," answered the manufacturer, "that is so." "But," said I, "how long have you worked here?" "Three years," was the answer, which proved to be the fact.

In conversing with the manufacturers on the numbers of very small children seen upon their premises, the almost invariable answer was (as it used to be among the woollen people in 1833), "that they did not employ them;" that the men find their own attendants and pay them, and that they, the masters, have no control over them:—and thus they attempt to get rid of the responsibility of this infantile employment. But the fact is, that, as they can and do discharge these children on the instant, and have discharged numbers who would have had to be sent to school had they been retained, so they might have discharged all the children at five years old that used to work before the Act was passed, had the moral question of their employment been impressible upon them.

The days will come, I presume, and sooner now than they would have done had the Factory Act not been introduced among the potters, when "jigging," or turning the potter's wheel, will be performed by machinery. In two instances only have I seen it hitherto. In one, where it has been in operation for some years; in another, where it has but just been introduced, but was standing for a very singular reason. As I understood, the introduction of this machinery had done away with the labour of one boy at each machine; and as the workman works by piece and pays his own attendants, so the cost of production had been lessened to the workman at the machinery by one boy each, or at the rate of about 2*s.* 6*d.* a workman per week, and this sum was therefore imposed as a rent upon the machine, which the workman was expected to pay, the other advantages of the machine being deemed compensatory for this reduction. This demand on the part of the master had been refused by the workman, and so all the machinery was standing. There are objections, however, to the immediate use of machinery for pottery purposes, which may postpone its introduction for some time yet. It requires, as it appears to me, a more educated class of workmen, a finer touch to regulate the speed, and a juster idea of the economy of power than as yet overspreads the minds of the potters generally. Moreover, it requires an outlay of which it will be difficult to impress the necessity on the minds of the masters; and last, and not least, it will require new buildings altogether in a majority of the "Banks" to render its employment available and free from danger.

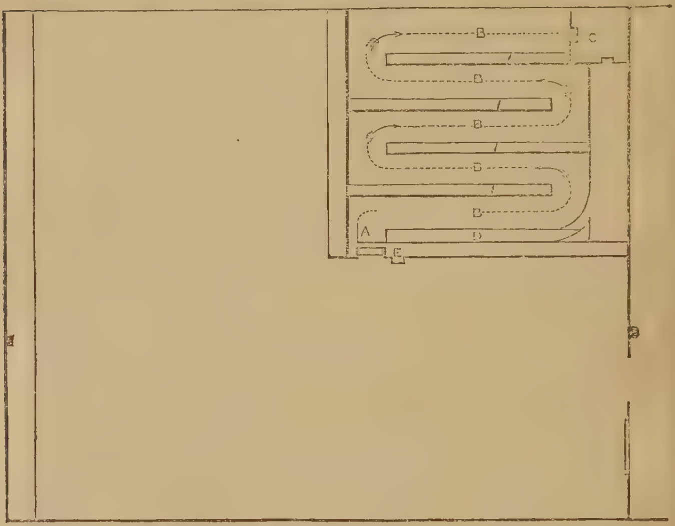
The children who work for the flat pressers are employed, first, in turning the wheel on which the workman forms the ware on moulds made of plaster of paris; second, in carrying the moulds with the ware upon them into an adjoining closet built within the flat presser's room, where there is a stove heated to a very high temperature, often as high as 141° Fahrenheit, and there placing them on shelves to dry; and, thirdly, in wedging the clay which the potters use. I could not use more exact terms in describing this employment, nor the reasons why the heat should be so excessive, than those which Mr. Longe has used, namely:—

> "These stoves are little rooms, or rather ovens, of about 13 feet square, and from 8 to 12 feet high, partitioned off from the shop. They are fitted inside with shelves, on which the moulds, with the moist ware upon them, are placed, in order that the ware may be dried sufficiently to be removed. In the centre is the stove, which I have often observed red hot. As the potter forms the plate or saucer on the mould, the mould runner runs off with it into the 'stove.' In proportion as the number of moulds with which the workmen is supplied is limited, has the heat of the stove to be raised, in order that the moulds may be more quickly dried, so as to be used again. Besides entering to place the moulds, the boy has also to enter to turn them, in order that the ware may not be hurt in drying."

As in overcoming most of the difficulties which arise in trade operations when first placed under legal restrictions, the questions are those of appliances more than anything else, so it is also in the construction and management of these stoves. There would never need to be excessive heat in any of the flat pressers' stoves, if there were moulds enough for the workman's supply. But as these moulds are somewhat expensive and cumbersome for storage, and are often not very carefully used by the workmen, so, where fuel is plentiful, their supply is limited to the smallest number consistent with the ware to be produced, and the stove is heated in proportion to the deficiency of moulds to be used. But when fuel is scarce and these moulds can dry, as it were, at leisure, their supply is more abundant, the question of the health of the mould runners not often being an element of consideration. Moreover, the construction of many of these stoves is about as bad as it can well be, for the health of all the workers engaged about them. In a well-regulated room (and I speak now entirely of the general system of stoveage), and even with a somewhat limited supply of moulds, the heat, though considerable, is not excessive. The stove is built close up to the top of the ceiling, the ceiling above being underdrawn, in order to protect the feet of the worker overhead; and the little doors by which the mould runner makes his exit and entrance are double, and so hung as to fall both ways, thus retaining the heat within the stove itself, as far as is possible. But the exceptions to this rule, which are unfortunately very numerous, are, that the outside walls of the stoves are only partially carried upwards, so that there is, perhaps, a 2-ft. opening over the top of them; that there are no doors to them, or, if there are, they are off their hinges, or that they only open one way, and are consequently always open; and thus the heat, which should be limited to the area of the stove for all purposes both useful and economical, is thrown into the whole room, till it is almost suffocating. The physical condition of these children, who are thus passing momentarily in and out of these stoves, may be imagined; the moral and mental can be scarcely less patent to any considerate mind. As I have said before, we only do not thus see the results of disease, from the resistance which young and vigorous life is capable of making against its inroads; but we may trace the elements of it in the evidences of wear and tear which, as I have shown before, these children prematurely exhibit. I quite agree with many of the witnesses who gave evidence before the Commissioners, that girls should never be employed as mould runners or jigger turners, and I trust to be able hereafter to report that the practice has been discontinued.

This old system of stoveage is, however, on the wane, and must shortly disappear altogether. There are already four or five other systems at work ready to supersede it, in all of which the heat is generated with a due regard to economy, and without its being at all needful that even the mould runner should come in injurious contact with it. In Messrs. Minton's establishment, most of the evils which accrue from the old system of stoveage are done away. They have erected a stove in one room, and others are to follow, consisting of a circular chamber built in one of the rooms, and supplied with heat by a brick flue; the fire-place being nothing more than an ordinary grate, and the flue, similar to that used for a greenhouse. The fire is fed from the flat pressers' workroom, just as that of a copper is in a kitchen; and the flue passes round the bottom of this circular chamber. Then, within the area formed by the flue, is a large wheel, like the paddle-wheel of a steam boat inverted, revolving on a perpendicular shaft. This wheel is encircled with shelves, which are capable of containing as many dishes or plates, or pieces of ware, as are made by the workmen of these rooms in a day. On these shelves, the moulds are placed through sliding doors, which, when lifted up, expose the shelves as the wheel revolves. When the wheel is quite full, all these sliding doors are kept shut, the moulds are left for a while to dry (whilst another wheel is being filled), and are afterwards removed and renewed. The temperature of this stove within, is about 90° of Fahrenheit, and quite hot enough for every useful purpose; and as this chamber is always kept shut up, save the slide to which I have referred, which is about two feet square, very little of this heat escapes into the room in which the flat pressers and their attendants are at work. The temperature of the room on the day I was there, scarcely exceeded that of the external atmosphere; whilst the moisture which escaped from the drying ware, being carried off into the air by another flue, was not at all inhaled by, nor rested upon the skins of the workpeople, which is important; for in stoves in which heavy or coarse ware is dried, the amount of evaporation is so considerable as to render chest affections prevalent. Those stoves are not expensive; and where there is room they are adoptable in all similar works, and would form a great improvement in the sanitary management of potteries. At Messrs. Elliott's, of Burslem, a similar stove is at work with great advantage, and in one or two other banks also; the only difference between them being, that the one is placed vertically, the others, horizontally. Messrs. Edwards & Co., of Burslem, have a new stove constructed on an admirable principle, having a width of about five feet, and occupying the whole length of an oblong room, on either side of which are the flat-pressers' benches. At the bottom of the stove, are iron pipes heated by hot water; and along the sides are sliding doors, which, when not in immediate use, are kept closed.

I will refer only to one other stove, and that because it is the invention of a flat-presser at Longton. The principle of the apparatus is Russian, and its success lies in the use of sand to retain the heat after the fire burns low. The entire stoves and flues, occupying a space of about four feet square by two feet high, are built of brick. The flues make several bends upon each other within the area of the stove proper, some of these bends being above the other, and all the interstices are filled with sand. The fire is contained in a small grate at one end of the stove, and the chimney is at the other end. The accompanying sketch is an attempt to exhibit this stove, and to show its interior arrangements, which, when filled in with sand, are covered over with loose stones, fitting closely over the top. The fire is at A, and the flue is continuously marked by B, terminating in the chimney. The walls of the flues are built of bricks on the edge, forming interstices to contain the sand. The sand once heated will retain its heat for a long period. C marks the chimney, into which there are two openings, one for the soot and one for the dust draft, to act also, as a ventilator, and which can be stopped up when required. D is the dust shaft, which not only draws the dust away from the room when it is swept, but abstracts the gases from the cinders when the damper is shut down to throw the heat into the room. E is a damper placed under the bars of the grate, so that when no more gases are evolved, it is shut, that the heat may be thrown into the room. This is generally done at night, so that in the morning the temperature of the room is always at a comfortable heat for the workmen to commence their labours, instead of, as formerly, the fires having to be lighted an hour previously to the pressers coming. The inventor is Mr. James Mears, a flat-presser at Mr. Thomas Birk's at Longton. One cwt. of coal or slack will keep the room in which this stove



is placed, at an average temperature of 60°. The room is left at 6 p.m. at that temperature, and at 7 the following morning it is only reduced two degrees. During the day the fire is allowed to burn nearly out, the damper is closed, and for four or five hours the heat is retained. The flues are found after four or five months use to contain no soot; and it is said that no damp is found in the room, even when the moulds are full.

THE JIGGER TURNER.

The labours of the jigger turner are not limited to mould running and jigger turning, but include also, wedging and carrying clay; in which latter operation, I regret to say, I have seen several young females employed; so frequently indeed, that I have been obliged to do that which is tantamount to forbidding it. The law enables me to seek the opinion of the certifying surgeon in any case in which I may observe a child employed on any work which appears to me to be beyond its strength; and if he thinks it is, its certificate may be cancelled, so that the child can no longer be employed at such work: or, if it is, it would be employed illegally, and the master become subjected to a penalty. On the 2nd November last, my attention was more particularly called to this kind of employment, by the following letter from one of the certifying surgeons:

> "I saw at a manufactory yesterday, a thin delicate looking girl of twelve, who has to run moulds, turn the jigger, and carry on her head ten or twelve times during the morning, from 50 to 60 lbs. weight of clay, for a considerable distance. In my opinion, no girl ought to be required to perform such an act. The employers say, in many instances, the weights placed upon the girls are more than they can carry, and that they are not unfrequently obliged to drop them by the way. One manufacturer asked me the other day, if the Act contained any provision for preventing girls from working at this particular employment altogether, as he was persuaded it was one of the greatest evils existing in the trade; that girls were frequently required to exert themselves far beyond their physical capabilities; and that the moral atmosphere to which they were exposed was something awful."

The operation of clay wedging, or beating out the remaining air after the clay has been boiled or pressed, is wholly unfit for little children, and especially for female children, unless it is done by very small divisions of the material at a time. A little boy or girl may be required to lift 40, 50, or 60lbs. of clay as high as it can reach, and then dash it down upon a table with all the force it can exercise, and this continuously the day through. The wedge of clay is then cut in two with a piece of wire, and rewedged, and so on until it is finished. Many of the girls whom I saw thus wedging, complained of the excessive fatigue which it occasioned. A workman, speaking of it, observed, "That "that was the work which soon made young people old."

"Clay wedging," says another of the certifying surgeons, "is, in my opinion, too laborious an occupation for boys and girls under 14 years of age, when followed during the greater part of the day with little or no intermission. In the case of girls, it is assuredly, to say the least, an inappropriate occupation, viewed apart from the question of their ability to pursue it.

"It should be interdicted to females under 16 years of age, and to male children as defined by the Factory Act.

"It is a rude unskilful process in which no conditions are perceptible which may not be as completely fulfilled by the agency of some simple piece of mechanism.

"There can be no doubt, I think, that the process of wedging clay involves a repeated forcible interruption of the function of respiration, and that this interruption must be in some measure prejudicial to the lungs, and must react somewhat injuriously upon the heart, where this sort of labour is persisted in daily; and it is not impossible that from this cause arises the asthma and the diseases of the heart and large blood vessels which are to be found in the death registers of the Potteries.

"The injurious effects of wedging will be produced in a higher degree in children and in young persons under 14 years of age. inasmuch as the bony framework of the chest has in such, not yet acquired its firmness and solidity, and as the cell structure of the lungs is still extremely delicate and predisposed to injurious influences.

"The act of wedging involves the unnatural distension of the air-cells, and a longer retention of air in them than natural, followed by forcible expulsion, conditions which are favorable to the production of an asthmatic condition."

DIPPERS.

The dipping occupation is one which is exceedingly injurious to health, the effects varying with different constitutions. The departments in which the workers are most subject to the poison of lead, which is used in dipping as a glaze, are the dippers and their assistants, the ware gatherers, ware-brushers, glost-placers, and ground-layers. Lead is largely used in the potteries for the purpose of glazing the ware, and in various ways becomes absorbed into the systems of the workers. And though it is stated that the quantity consumed now-a-days is by no means so large as formerly, still there is sufficient to produce material results as regards disease, and therefore to require such measures as may tend to diminish the effects of that absorption, and to counteract them as much as possible. In the manufacture of earthenware, lead is generally imbibed either by inhalation, by habitual contact with its compounds on the skin, or by the accidental introduction of them into the stomach with the food. In whatever way it is introduced, the effects of it are:—

1. Functional disease of the alimentary canal:
2. Paralysis of some of the muscles:
3. Ulceration of the gums and sockets of the teeth, accompanied by a peculiar blue line, which is seen to run along the margin of the gums, but is absent where a tooth or stump is wanting.

This blue line is what Dr. Christison* calls "a warning symptom;" and it is so much so that, if it were attended to as it deserves to be by the workers themselves, timely measures might be taken by them to prevent further mischief, a mischief which is exceedingly apt to recur when once it has acquired a complete form, and the system is re-exposed to the same influences; and to lead to a species of apoplexy, which ends fatally, or to a partial paralysis, which renders further labour impossible. This species of paralysis affects chiefly the upper extremities, and is attended with excessive muscular emaciation. The loss of power and substance is most remarkable in the muscles which supply the thumb and fingers. On enquiry, I have found some of the dippers complain of several of these symptoms. The blue line indicating the absorption of lead is very common; colica pictonum not so much so, though a few have had it; and partial paralysis of the fingers or wrists, is not unusual. Among the patients of the North Staffordshire Infirmary the blue line indication is so common as almost to cease to be remarkable.

It is, no doubt true, that the susceptibility to lead poisoning varies very much with the different idiosyncracies subjected to it. Some will bear to work amongst lead preparations for years without any serious results accruing from it; others again will suffer from a single day's contact with it. But sooner or later colic comes on; the wrists drop, or the ball of the thumb is painful, unless prophylactic measures are resorted to at the onset, and continued at intervals, in order to prevent any accumulation of the mineral in the system, and to release it of it. Dr. Watson writes of this blue line as a capital sign by which workers in lead may be cautioned as to the absorption of this poison, and of the necessity of some treatment by which its effects may be avoided. It may be useful to quote in full a paragraph of his, not only for directions sake, but as justifying the prophylactic treatment which I have recommended to be followed under the provisions of the Act, and under the article "Cleanliness." He says—

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* Christison, On Poisons.

"It is observable of this disease, as of many, and indeed of most others, except certain contagious febrile diseases, that when once it has occurred, it is much more liable to occur again upon a repetition of the exciting cause than before. It is of very great moment, therefore, that they who are necessarily exposed to the poison of lead, as painters, plumbers, printers, colour grinders, potters, and glass blowers, &c. should be made aware of the means which are best adapted for their protection against the injurious agency of the poison; and we ought to be able to give them advice in that matter. The rules for their guidance are short and simple; and, if carefully observed, I believe they will generally be successful. They resolve themselves into cautions against the admission of the metal or its compounds into the body through any channel.

"1. To prevent its introduction through the skin, minute attention to cleanliness is necessary. The face and hands should be washed, the mouth rinsed, and the hair combed several times in the day, and bathing and ablution of the whole body should be frequently performed. Also, the working clothes should not be made of woollen, but of strong compact linen; and they should be washed once or twice a week at least. They should be worn as little as possible out of the workshop; and some light impervious cap might protect the head while the workman is at his labour.

"2. Care should be taken that none of the poison should be admitted into the system with the food. The workmen, therefore, should not take their meals in the workroom, and should be scrupulous in cleansing their hands and lips before eating.

"3. The entrance of the poison into the air passages during respiration should be guarded against as much as possible.

"4. Butter and bacon, and other fat articles of food, especially at breakfast, are strongly recommended. A physician at Breda informed Sir George Baker that the village in which he lived contained a great number of potters, among whom he did not witness a single case of lead colic in the course of fifteen years; and he attributed their immunity to their having lived very much on butter and bacon and other kinds of fat food. Liebig says that the disease called painter's colic is unknown in all manufactures of white lead, in which the workmen are accustomed to take as a preservative, sulphuric acid in lemonade, a solution of sugar rendered acid by dilute sulphuric acid. Mr. Benson, the manager of the British White Lead Works in Birmingham states that in the summer of 1841 he first added sulphuric acid to the treacle beer, used as a beverage by the workmen. Lead colic, which had pervaded before to a distressing extent, soon began to diminish in frequency; and from October in the same year, up to December 1842, not a single instance of the disorder had occurred amongst them."*

The total number of persons in the Potteries who are more or less exposed to the influence of lead, amounts to 1,136 males and 267 females. Of this number, only about 700 are employed in immediate contact with it in a fluid state, supposing that mineral to form an invariable ingredient in the glaze used.

With respect to the danger of its absorption by food, the law has provided specially, "that at no time after the "passing of this Act shall any child, young person, or "woman be allowed to take his or her meals, or to "remain during any time allowed for meals, in the "dipping houses, dippers' drying rooms, or china scour-"ing rooms." But it falls short of the really prophylactic measures necessary to prevent the effects of lead poison among those who form the largest number of workers among this mineral, I mean the adult men. No part of the Factory Laws directly interferes with the labour of men, it is true; but this precautionary measure might have gone beyond this limit, and have included them also in these mealtime regulations. But more is wanted than even this. There needs, as Dr. Watson has shown, and as my own experience confirms, disciplinary regulations as to dress, as to ablution and the means afforded for it, and as to recommendations with respect to diet and beverages. The admonitory blue line might always guide the humblest intellect. It is not only in water externally, or sometimes in condiments, that lead, as Dr. Watson says, "may be "introduced into the system with the food, but by the "skin also, in a variety of ways." Thus the dipper, whose hands are most days, for hours, covered with lead compounds held in suspension, washes them probably, when he ceases to work, and when he goes to his meals; but he dries them on his apron, which is already thoroughly impregnated with lead from splashes occasioned by his manipulations. He will tell you, that he uses a nail brush to his skin and nails as soon as he arrives at home. But I should prefer that he should use one also at the works before he goes home; for the process of absorption is sometimes a very rapid one. I have, therefore, requested that slop sinks, soap, clean water, nail brushes, and towels shall be provided by the employers on the works, and that the dippers and their assistants shall be instructed how to use them properly.

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* Watson, On the Principles and Practice of Physic.

And if treacle beer and lemonade, acidulated with dilute sulphuric acid, possess the useful properties to which the physician at Breda, and Mr. Benson have referred, then indeed it is encouraging to find, that a vast benefit may be conferred very easily and inexpensively on this class of artizans, of which they have not hitherto sufficiently availed themselves. They can henceforth seek for the blue line in the gums themselves, without any reference to the physician. They can possibly prevent its formation by a diet which is a favourite one amongst the working classes, and which it is never difficult to provide. And if after all, the system is too obstinate to yield to this simple treatment, they can still be warned in time, and by professional assistance avert the consequences that would otherwise be inevitable.

SCOURERS.

The operation of scouring has long been a source of considerable anxiety, not only to the manufacturer, but to the operatives, for it is one of an almost certainly fatal character if persisted in. One master potter assured me that he had lost 15 girls, scourers, in 16 years.

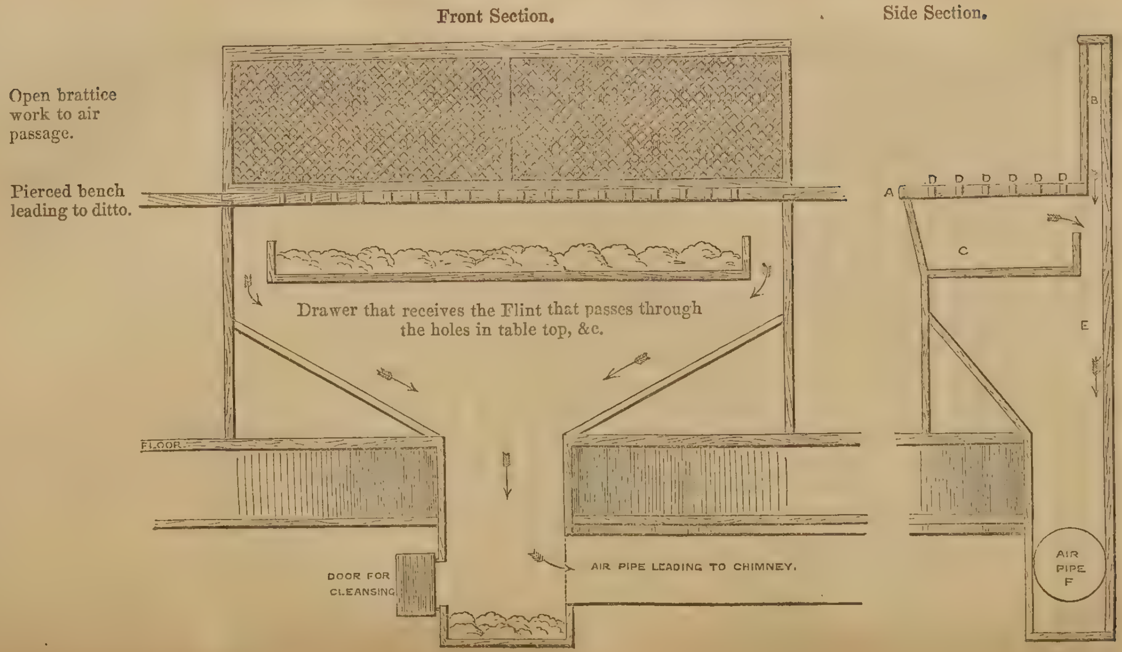
The operation consists in divesting the ware of the fine flint powder in which it has been fired; but in so doing, the fine dust flies in clouds about the heads and persons of the scourers until they are quite white with it; and as a considerable quantity is inevitably inhaled, bronchial irritation is set up, which ends in diseases of the lungs and death.

Many contrivances have been from time to time attempted by which to avoid this unfortunate result, without effect; for this flint powder is valuable, and but little is allowed to waste, thus rendering remedial measures still more difficult of accomplishment.

In a conversation with a manufacturer on one occasion, on this subject, who had once been at the bench himself, he informed me that at that period, he had contrived a fan turned by a boy, by which this flint powder was successfully carried off; but as the boy worked in the same room as the scourers, and was constantly stopping to talk to them, the draught could not be kept continuous, and the evil being unremedied, the plan was abandoned. It struck me, however, as possible, to contrive a pierced bench that should communicate with a chimney or flue, the draught from which, whilst it would be powerful enough to withdraw the flint dust from the room, would not be so powerful as to be felt by the workers; and with such stops within the conductor from the bench as should prevent the escape of the flint.

Shortly afterwards, on visiting the "bank" of Messrs. Davenport, of Longport, in passing through the scouring room, I suggested to Mr. Shirley the idea which had occurred to me, and he most obligingly expressed his readiness to try how far it would be successful; and sent at once for his carpenter and mechanic, to receive my orders, and to carry them out with any improvements of their own, which they could add. On page 80 is a sketch of the plan now adopted in Messrs. Davenport's "Bank;" and in a letter to me Mr. Shirley says, "I send you herewith a drawing of "the ventilator we have put up in the china scouring shop, "and which we intend to apply to the groundlaying shop also; "for as we find it to answer for the one, it will, no doubt, "be equally useful for the other branch. The cost of it is "about 5*l*., but we can make another for much less money; "and where the pipes have not to be carried under the floor, "the cost will be still less. A is the bench at which the "workers sit when scouring. B is the brattice work (opening "into the shop), through which the air of the room passes, as "well as through the holes of the pierced bench. D marks "the opening through the bench into the drawer below, "which is made large enough to admit the heavier portions "of flint to fall through, yet not so large as to cause an "excessive current of air through the air passages, which "are defined by E, and which run towards F, a pipe carried "forwards into some convenient chimney; then beneath "the floor is another catch box, with a door by which it "may be cleansed. The whole process is exceedingly simple, "effectual, very inexpensive, and when in general adoption "will be preservative of many valuable lives;" and to Mr. Shirley, for his confidence and enterprise, will, I have no doubt, form one of his happiest business recollections.

PLAN OF VENTILATOR for China scouring shop and for ground-laying shop.


Front Section.
Side Section.
Open brattice work to air passage.
Pierced bench leading to ditto.
Drawer that receives the Flint that passes through the holes in table top, &c.
FLOOR.
DOOR FOR CLEANSING
AIR PIPE LEADING TO CHIMNEY.
A
B
C
D
D
D
D
D
D
E
AIR PIPE F

General Want of Ventilation.

I found in the pottery rooms many ineffectual attempts at ventilation by the employers, evidencing not only the necessity, but their desire for its accomplishment. But some of the work rooms are very small, formed as they have been out of the old cottage dwellings to which I have before adverted; or, of other improvised rooms, in which the accommodation, if it was originally sufficient, has long been inadequate for the purposes to which they are now applied. In some "Banks" workshops have been placed around skeleton hovels, two stories high; and so closely are they built round that part of the chimney where the fire breaks out of the oven that they render the wall of the chimney excessively hot when the oven is at work; so hot, indeed, that it is next to impossible, without great danger to the health of the worker, to permit employment in such places. Yet many females are employed in them all day long, and especially in the summer months, when the heat is greatly augmented, with a thermometer probably ranging from 90° upwards. In the flat-pressing rooms also, excessive heat prevails, as well as in many of the printing shops, in which very small female children are sometimes crowded with other workers within the smallest possible space. In several of the other shops in which groups of people are assembled, there is considerable heat; but in these, it is not so much a diminished temperature as a better system of ventilation which is required. In the first of these cases, namely, around the skeleton hovels, I have requested that no worker may be placed where there is not eight clear feet between the back of the worker and the brickwork of the hovel. No manufacturer who is at all considerate about his workpeople would allow them to work in such a situation under any circumstances; and by most of them it is very strongly condemned. But if, from want of room, it is absolutely necessary, then, it ought only to be under such conditions as would lead to the smallest possible amount of mischief. In these and the other rooms where I have found ventilation necessary, I have requested that, ventilators of small iron bars, or of coarse wire gauze, in each case not less than three inches in breadth and sixteen inches in length, should be inserted into the walls on either side of the room, close to the ceiling, so as to permit of the exit of the heated air, without the possibility of cold air falling upon the persons of the workers. Where the rooms are less than 12 feet feet high, I have also requested that conductors of wood, tin, or iron, with side gussets, should be placed in front of these ventilators, close to the wall at the bottom of the conductor, and three inches from the wall, at the top, so as to direct any cold air that might enter the room by them to the ceiling, and in like manner, from the persons of the workers. Where the rooms are not underdrawn, but are capable of having openings made into the external air itself, then, I have requested that ventilators of the same dimensions may be inserted in the centre of the roof, with covers to shield them from the rain fall, one for every fifteen linear feet. In a great many instances all these recommendations have been most readily and cheerfully adopted, and, I am happy to inform you, with success. So far, indeed, as I can hear, the workpeople employed in such rooms, no longer complain of draughts, as they were wont; whilst they and their employers. already begin to experience and to acknowledge the benefit of the alterations.

On the general mortality of the Pottery Districts, Dr. Arlidge, of Newcastle-under-Lyne, published a series of elaborate calculations, previously to the Extension Act being passed, showing that this mortality considerably exceeded that of all England, and especially the mortality of infants. Objections were, however, made to his inferences, on account of the year from which they were drawn being said to be an exceptional one; and no small amount of blame was cast upon him for his expositions.

But by an analysis of the deaths which took place in the potteries proper in 1864 I suspect Dr. Arlidge's conclusions to be right: as might have been expected from one who holds the high position he does in his profession, namely, that of senior physician to the North Staffordshire Infirmary.

I regret that I have been unable, from want of time, to compare his Tables with the general Tables of mortality; otherwise, I think, the contrast between those of all England and the potteries would have still more strongly confirmed his conclusions. But I publish a Table of these deaths, arranged as to ages and diseases, in townships, not only on account of its general interest at this time, but for future comparison; and with respect to two points in particular, which are salient, namely,—

1st. The amount of diseases of the chest to which the adult and adolescent workers are liable, arising doubtless from the heated and vitiated atmospheres to which they are exposed; and,

2ndly. The excessive infant mortality amongst them, attributable, I fear, mainly to maternal neglect, or to causes arising from improper ingesta, in consequence of the employment of the mothers from home.

There is considerable difficulty in making an exact comparison between the deaths in potters' families exclusively and those of the general population with which they are associated; because, whilst the total number of persons living, can be taken from the Census returns, that of the potters' families *per se*, can only be assumed.

Thus, for example, in the district of Tunstall, Wolstanton is included; but the subdivisions of Wolstanton consist, for the most part, of rural groups, with a few potters residing amongst them, and therefore the gross amount of deaths ought to be less in the Tunstall district than in Longton, for example, where the number of potters' families compared with those of the general population is numerically larger. I should think that Wolstanton proper gives a fair idea of the normal rate of deaths among rural populations in North Staffordshire, and we find it to be 1 out of every 41 persons, less the decimals.

But in order to arrive as nearly as possible at the number of persons in the potters' families, separately from the families of other persons, I have first deducted one person per family, according to the number of the potters' families (in both cases ascertained by reckoning five persons to a family, as it is shown to be by the Census), from the gross population, and then have added that number to the number of working potters in each district. I had added two persons to a family, but in consequence of the excessive infant mortality amongst them, and of the high rate of mortality of adult life also, I believe that two would be in excess, and have therefore only taken one.

Thus, for example, the gross population of Tunstall township, and the townships which compose the Wolstanton union amounts to 32,029, and the total deaths amongst them in 1864 to 829. The total number of working potters, at all ages, in Tunstall, is 3,332. By dividing this number by five, we obtain the number of potters' families, and adding the quotient to the total we get 3,998 as the approximate census.

TABLE, showing the population of the five Pottery Districts, the gross deaths in 1864, the deaths in Potters' families separately, and the diseases of, and the ages at, which those persons died.

	Longton.	Wolstanton and Tunstall.	Burslem.	Stoke and Fenton.	Hanley and Shelton.
Gross population	16,857	32,029	22,327	19,472	33,009
Deaths	524	829	685	501	966
Potters' deaths	256	150	316	138	304

Diseases.	Longton.						Wolstanton and Tunstall.						Burslem.						Stoke and Fenton.						Hanley and Shelton.						Together.						Total Diseases, 1864.
	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	
Aneurism	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Apoplexy	–	–	–	–	2	–	–	–	–	–	1	–	–	–	–	1	2	1	–	–	–	–	1	–	1	–	–	–	1	3	1	–	–	1	7	4	13
Asthma	–	–	–	–	1	–	–	–	–	1	1	3	1	–	–	–	7	2	–	–	–	–	2	2	–	–	–	–	5	3	1	–	–	1	16	10	28
Anasarca	–	1	1	–	1	3	–	–	–	–	3	–	–	–	–	–	3	2	1	–	–	2	3	2	1	1	–	1	3	1	2	2	1	3	13	8	29
Asphyxia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Atrophy	–	–	–	–	–	–	–	–	–	–	–	–	9	–	–	–	–	–	1	–	–	–	–	–	7	–	–	–	–	–	17	–	–	–	–	–	17
Abscess	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	1	–	1	–	–	–	2	–	3
Aphthæ	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	1
Anæmia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	1	–	–	–	1	–	2
Accident	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	1
Burn	–	1	–	–	–	–	–	1	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	1	1	1	–	–	–	1	5	1	–	–	–	7
Bronchitis	14	1	–	2	2	7	6	4	–	3	3	3	14	5	–	1	10	5	3	–	–	1	5	2	6	4	–	2	14	8	43	11	–	9	34	25	125
Breast milk, want of	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	1
Brain, disease of	–	–	–	1	1	1	–	2	–	–	1	1	–	–	2	2	–	–	1	–	–	2	–	–	–	–	1	–	–	–	1	2	3	5	2	2	15
Convulsions	39	4	1	–	–	–	12	1	1	–	–	–	47	3	–	–	–	–	11	–	–	–	–	–	17	2	3	–	–	–	126	10	5	–	–	–	141
Croup	1	1	–	–	–	–	–	3	–	–	–	–	8	7	–	–	–	–	–	–	–	–	–	–	4	6	–	–	–	–	13	17	–	–	–	–	30
Cynanche	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Cephalitis	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Colica pictonum	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Climacteric	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Cystitis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1	2
Childbirth	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Congestion of lungs	–	–	–	–	–	–	2	–	–	–	–	–	1	2	–	–	1	–	–	–	–	–	–	–	–	–	–	1	–	–	3	2	–	1	1	–	7
Collapse of lungs	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	1
Childbirth	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Debility	8	1	–	–	–	–	5	–	–	–	–	–	13	–	–	–	–	–	2	1	1	–	–	–	6	–	–	–	–	–	34	2	1	–	–	–	37

Diseases.	Longton.						Wolstanton and Tunstall.						Burslem.						Stoke and Fenton.						Hanley and Shelton.						Together.						Total Diseases, 1864.
	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	
Diarrhœa	8	–	–	–	–	1	12	–	–	–	–	–	13	1	–	–	1	–	3	1	–	–	–	–	7	–	–	–	–	1	43	2	–	–	1	2	48
Drowned	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	1	–	1	1	–	3
Dysentery	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Diphtheria	–	–	–	–	–	–	1	1	–	–	–	–	1	3	–	–	–	–	–	–	–	–	–	–	2	1	–	–	–	–	4	5	–	–	–	–	9
Diabetes	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Epilepsy	–	1	–	–	–	–	4	–	–	–	–	–	1	–	1	1	–	–	–	–	–	–	1	–	–	–	1	–	–	–	5	1	2	1	1	–	10
Enteritis	3	1	1	1	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	2	–	–	–	–	–	–	–	–	–	5	1	3	1	–	–	10
Enotherismus	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	1
Fever	1	–	–	–	–	–	–	1	–	2	–	–	1	1	4	–	1	–	–	–	2	–	1	–	–	1	–	1	1	1	2	3	6	3	3	1	18
Found dead	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	1
Gangrene	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
General decay	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	3
Gastric fever	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	1	2	–	–	–	–	1	3
Genitals, disease of	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Hydrocephalus	6	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5	–	–	–	–	–	11	2	–	–	–	–	13
Hooping cough	–	2	–	–	–	–	–	1	–	–	–	–	7	2	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	8	5	–	–	–	–	13
Hæmoptysis	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	2	1	–	3
Hepatitis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	1	–	–	–	–	–	1	–	–	2	3
Hydrothorax	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	1	–	–	–	2
Herpes	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Hæmatemesis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Hæmaturia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	1
Heart, disease of	–	–	1	1	4	–	–	–	1	–	2	3	–	–	3	1	2	2	–	–	–	3	1	1	–	–	4	1	3	–	–	–	9	6	12	6	33
Influenza	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	–	1	–	2
Jaundice	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Kidney, disease of	–	–	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	2	1	1	–	4
Laryngitis	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	1	–	–	–	–	2
Lung, disease of	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	1
Marasmus	2	–	–	–	–	–	1	–	–	–	–	–	5	–	–	–	–	–	2	–	–	1	–	–	8	2	–	–	1	–	18	2	–	1	1	–	22
Malignant ulcer	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Morbus coccinius	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1
Measles	–	–	–	–	–	–	2	1	–	–	–	–	9	9	–	–	–	–	–	–	–	–	–	–	6	7	–	–	–	–	17	17	–	–	–	–	34
Meningitis	–	–	–	–	–	–	1	–	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	–	–	1	–	1	–	–	1	3	–	1	–	–	5
Malformation	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Obstruction	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	2

Diseases.	Longton.						Wolstanton and Tunstall.						Burslem.						Stoke and Fenton.						Hanley and Shelton.						Together.						Total Diseases, 1864.
	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	Under 1 year.	1 and 5.	5 and 20.	20 and 40.	40 and 60.	60 and upwards.	
Old age	–	–	–	–	–	–	–	–	–	–	–	6	–	–	–	–	–	4	–	–	–	–	–	4	–	–	–	–	–	6	–	–	–	–	–	20	20
Pertussis	8	2	12	25	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	8	2	12	25	3	–	50
Phthisis	5	2	–	–	–	–	–	–	4	5	7	–	1	–	7	19	6	–	2	–	2	10	6	–	2	1	1	28	12	–	10	3	14	62	31	–	129
Pneumonia	12	1	–	3	1	–	5	–	1	1	–	1	12	4	1	–	–	–	2	–	–	–	1	–	2	6	2	1	3	–	33	11	4	5	5	1	59
Premature	1	–	–	–	–	–	2	–	–	–	–	–	3	–	–	–	–	–	2	–	–	–	–	–	2	–	–	–	–	–	10	–	–	–	–	–	10
Paralysis	–	–	–	–	–	4	–	–	–	–	–	3	–	–	–	–	1	–	–	–	–	–	1	1	–	–	–	1	2	2	–	–	–	1	4	10	15
Purpura	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1
Phrenitis	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	1	1	1	–	–	–	–	–	1	–	–	3	1	1	2	–	–	7
Pleurisy	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Peritonitis	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	2	1	3
Physical deformity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Pyæmia	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	1
Rheumatism	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	2	–	–	2
Small pox	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	1
Scarlatina	–	1	1	–	–	–	–	3	–	–	–	–	2	1	–	–	–	–	2	1	–	–	–	–	5	8	3	1	–	–	9	14	4	1	–	–	28
Scirrhus	–	–	–	–	1	–	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	1	3	–	–	–	–	2	6	–	8
Stricture	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1	2	–	–	–	–	1	3	–	4
Scurvy	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	1
Syphilis	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1
Stomatitis	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	1	1	1	–	–	–	3
Scrofula	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	1	2
Scalding	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	1	2	–	–	–	–	3
Spine, disease of	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	1
Spleen, disease of	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	1
Suicide	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	–	1
Typhus	–	1	1	–	–	–	–	–	2	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	1	2	1	–	–	1	3	5	1	–	–	10
Tabes	10	4	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	2	–	–	–	–	–	1	–	–	–	–	–	14	4	–	–	–	–	18
Trachitis	–	3	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1	1	–	–	–	–	–	–	–	–	–	–	1	5	–	–	–	–	6
Teething	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	–	–	–	3
Tumour	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	1
Tonsillitis	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1
Ulcer	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	1	–	–	1	–	–	1	–	–	1	1	–	2	–	4
Unknown	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	–	–	1	1	–	–	–	–	1	–	–	3	–	–	2	1	–	6
Uterine	–	–	–	2	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–	–	–	–	3	2	–	5
	122	30	19	37	19	17	58	20	11	19	20	21	155	43	20	28	42	19	44	8	7	24	29	13	91	48	23	47	57	29	470	149	80	155	167	99	1,120

Then if we subtract 3,998 from 32,029 we obtain 28,031 as the dividend of the general families. The total potters' deaths in Tunstall in 1864 were 150, and if we subtract this sum from 829, the gross number of deaths, we obtain two divisors, one for each population, and these give the ratio of deaths, first among the general population, exclusive of potters, as 1 for every 41 persons, and amongst potters, as 1 for every 26, or thereabouts.

In like manner, if we analyse the deaths for the other four districts, we find that, for the general population, which is less of a rural character than that of Wolstanton, it is 1 to every 37 persons, whilst for the pottery population it is 1 for every 29 persons per annum, less the decimals.

On examining the table, with reference to the two points to which I have adverted, it will be seen that out of the whole number of deaths, namely 1,120, 470, or upwards of 41 per cent., died during and within the first year, and 149, or 13 per cent., over one year, and under and during the fifth year of life, making a total of 619 deaths, or 55 per cent. under five years of age.

Of these children there died,—

28	per cent.	of diseases of the	chest.
24	,,	,,	brain.
13	,,	,,	bowels.
5	,,	,,	congenital debility,

and not less than 11 were either scalded, burnt to death, or drowned.

Of the diseases of the	chest,	57	died of	bronchitis.
,,	,,	30	,,	croup; and
,,	,,	44	,,	pneumonia.
,,	brain	136	,,	convulsions; and
,,	,,	13	,,	hydrocephalus.
,,	bowels	44	,,	diarrhœa.
,,	,,	17	,,	atrophy; and
,,	,,	20	,,	marasmus.

Of the 501 adolescents and adults there died of—

Apoplexy	12	or	2	per cent.,	less decimals.
Asthma	27	,,	5	,,	,,
Anasarca	25	,,	4	,,	,,
Bronchitis	68	,,	13	,,	,,
Brain disease	12	,,	2	,,	,,
Heart disease	33	,,	6	,,	,,
Phthisis	117	,,	23	,,	,,

Now, if we were to trace the causes of this fearful mortality, both in the one class and the other, we should, I think, have no difficulty inassigning them rightly. In the latter case, we should attribute the diseases of the chest for the most part to the heated and vitiated atmospheres of the workshops, and to the nature of the occupations, and partly too to the insocial habits of the people themselves. In the former, we should refer them to atmospheric causes, with scantiness of clothing, want of shelter and protection, and to an irregular supply of good food, by which these influences might have been more or less resisted. This, at all events, is certain, if we were to attempt to find an analogous case in natural history, to this fearful rate of deaths by convulsions alone, we should utterly fail in our object, so far as I ever heard or read of. And the same may be said of the causes of hydrocephalus, atrophy, marasmus, and diarrhœa, which are all diseases more or less the product of deficient nutrition, from irritants introduced into the system, probably by human milk vitiated by long retention and by the movement of the arms during work; or by narcotics, intended to soothe the recipients to sleep for the hours during which they are left to nurse.

I think, indeed, that the whole amount of deaths charged upon maternal neglect, may be inferred from the one fact that 11 children under five years old were either burnt or scalded to death or drowned in one year! And we may gather what mischief accrues to the offspring of working mothers, when not less than 37 children under a few weeks old, died, from debility of constitution. And so, when I consider this aggregate loss of human life, and especially of infant life, from all the causes to which I have directed your attention, and believing that, of these 619 children, the majority of them were destroyed by the mothers' want of leisure for domestic education, by lack of example, of discipline, of economy, when they might have been saved to the country, I can only feel a regret which I am unable to express in words, and hope for the advent of that time, when life will be of more value in the consideration of commercial economy, than it now appears to be; and when, with their ordinary business, it will be the pleasure of employers to think as much of the homes and of the necessities of the persons who work for them, as they do of their own.

I admit that it is scarcely fair to address you so strongly on this subject without at the same time suggesting a remedy for the evil. But there is one, and it may be afforded in one of two ways,—

The first and best, is the exclusion of young mothers from congregational employment.

The second is, where they are employed, the enforcement of a six weeks rest from the day of their confinement; and,

Then, the adoption in every industrial district of the nursery schools, of which in the following pages I have given an illustration. I do not attempt to argue the first of these problems. I know that it would be wise in a national point of view, and I believe it would be economical in a commercial one.

To the second I have ventured more than once to call your attention in previous reports by reference to the system of M. Dolfus, of Mulhausen, in France, who insists upon a six weeks rest by every mother after her confinement, and supplements her wages by contributions from her fellow workers, with results which are most satisfactory.

With respect to the third, in the subsequent article on schools in this report you will find a very interesting account, detailed by a lady, of whose exertions on behalf of her countrywomen I cannot speak too highly.

But, lest my view should be considered as an excess of utilitarianism, let one of the large cotton spinners of our own country be heard on this question.

"Stockport News Rooms.

"The members of some half-dozen Working Men's News Rooms, recently established in different parts of the town, after the model in Portwood, united on Tuesday evening in a grand tea party at the Mechanics' Institution. The large hall was crowded chiefly by working men and their families, tickets for as many as accommodation could be found having all been disposed of some days ago. The Mayor (W. L. Eskrigge, Esq.) presided; and was supported on the platform by Mr. Watkin, M.P., Mr. E. C. Howard, Dr. Watts (Manchester), Mr. Wright, the prison philanthropist, Aldermen Longson and Barr; Councillors Walthew, Howard, Leigh, and E. B. Fernley; Mr. Walmsley, the Rev. J. Evans, Lieutenant Steen, Mr. R. Roberts, &c.

"A select glee party, with Mr. Edmondson at their head, gave their services, Mr. W. Hope presiding at the piano-forte.

"The Chairman, in commencing the proceedings, said that however much inclined he might be to inflict upon them a speech, the committee had not only requested him not to do so, but had supplied him with no materials, and he knew little of the object of the meeting further than it was to encourage working men's clubs. No doubt such institutions were good when they were properly used, because they had attractions which would draw working men, and especially young men, from the public-house. (Applause.) He was not one of those strait-laced people who thought that a man should not enjoy a glass of beer, even though it was at a public-house. (Hear, hear.) The chief cause of that resort was not a love of leaving their wives and children at home. No doubt, working men thought as much of their wives and children, and enjoyed their society, quite as much as those in a higher sphere. It was because there were evils connected with the factory system which somehow or other compelled women to leave their homes and to go to work during the day. Working men could not expect to be as comfortable as they would be if their wives remained at home. Neither the men nor their wives were to blame; it was the system from which they were at present suffering. He hoped the time would come, and he should very much like to see it, when there would be no occasion for married working women to leave their homes during the day. (Cheers.) Let that once be carried out; it might not be possible to carry it out immediately; but good times were coming, and he hoped with them would come the opportunity for the husband to earn such wages as would, if he was not a very avaricious and greedy man, maintain himself, his wife and family in comfort, without sending his wife from home to work; then they should see and hear far less of the public-house, as the men would remain more at home, spending their time with their wives and their children, and there would be less necessity also for these clubs; for he was not an advocate for either a rich or a poor man spending his time away from his family. A wife who had been all the day attending to household affairs, had a perfect right to say to her husband, 'You must spend your evening with me.' Of course there were exceptions; and he, during the coming year, no doubt frequently got blamed for spending his time away from home. But they must be prepared to make sacrifices for the benefit of others. (Applause.)"

These are sentiments which will some day, I hope, find a response in the heart of every manufacturer in the kingdom, and long may the Mayor of Stockport wear the honour which he deserves, in being the first of his class to give utterance to them.

The Social and Provident Proclivities of Potters.

In any consideration of the social state of the Potteries, the question of wages must take precedence; for without some knowledge of the sources of income, we can form but an indifferent estimate of the expenditure, either of an individual or of a class, the tendency to debt being, pro rata, equal. It has been shown that the potters in the Potteries proper amount to 11,323 men, 6,332 women, 3,561 young men, 2,749 young women, and 3,913 children; and from reliable information, I believe in ordinary times, that the aggregate amount of wages distributed among them weekly, amounts to 21,264*l.* 7*s.*, or about 15*s.* 3*d.* per person, young and old. It will not, however, be a difficult task for those whom it may more immediately concern, accurately to calculate this amount from the departmental figures contained in this Report. This rate is considerably above any textile average that I am aware of, and many other averages also; and for various reasons a comparison with the wages of other trades will not be without interest. Thus, for example, not very long ago, the average weekly rate of wages in the following other trades was as follows:—

	s.	d.
In the Iron trades - - -	18	0
In Dyeing - - - - -	17	8
In Fire-clay - - - -	17	2½
On Railways - - - -	16	11
(In China and porcelain) - - -	15	3
In Paper - - - -	14	8¼
In Silk (spinning) „ - -	12	8¼
In the Woollen manufacture - -	11	7¾
In Worsted „ - - -	10	5¾
In the Cotton manufacture the average wages per week per person was about -	10	6
In common Earthenware - - -	9	10¼
In Flax „ - - -	8	0

So we find, notwithstanding the number of children and females employed in the pottery trade, it stands fifth on the list of twelve occupations such as these; and that the wages are so large as to constitute an element of considerable social importance to the class amongst whom they are distributed.

With 15*s.* 3*d.* per head per week, there ought to be some very prominent economical and educational features amongst the Pottery population; since high wages are a vast power for good or evil, accordingly as they are the property of educated or uneducated recipients. And it is satisfactory to find that, persons have been found considerate enough, and interested enough in the welfare of their neighbours, to endeavour to direct the distribution of these receipts into a proper channel, and that these endeavours have met with considerable success. Thus, Mr. Palmer, of Longton, writes—

> "The provident institutions established in the town have contributed largely to its improvement. Some of the earliest of these institutions were identified with the Sabbath school system, and were called 'The Children's Saving Fund,' established for the laudable object of enabling parents to provide for the clothing of their children, and to secure other household comforts. In this fund, parents and children were allowed to accumulate their savings without interest. And to show the extent to which they

were made use of, from one of these funds, 400*l.* was invested in one year by upwards of 700 depositors. Since saving banks and other facilities for depositing money at interest have arisen in the town, these societies have diminished in extent and importance. They continue to exist, however, though in a limited degree. In three schools from which I have obtained returns 304*l.* 10*s.* 4*d.* was saved during the first year by 553 depositors; and it is due, no doubt, to these commencements of savings, that in hundreds of instances the germ of provident habits has been fostered and brought to maturity.

"In addition to these savings banks, there are insurance societies, and sick and friendly societies, eminently calculated to benefit the working classes. Last, though not least, I would notice another institution which has yielded a giant power for good, and borne a very important share in improving, re-organizing, and remodelling the town, and in elevating its social status: I allude to building societies. These have taught fresh practical lessons in life, which will long be remembered with pride and gratitude. They have effected reforms in character, improved positions, elevated and enlarged conceptions, and with many, have changed the very objects of life. They have incited to industry, economy, and forethought. A man can plant his foot on his own little spot of earth, and with honest pride, call it his own.

"There had been several building societies in Longton before 1850, but it was not till then that the Longton Freehold Society commenced its operations, and purchased estates. Amongst others, what is called the Dresden Estate was purchased for 6,259*l.* 4*s.* 1½*d.*, and divided into 190 lots containing nearly 600 yards each, amongst 101 shareholders. Sutherland Road Estate was purchased at a cost of 1,346*l.* 2*s.* 3*d.*, and divided into 41 lots among 29 members. Bridge Street Estate was purchased at a cost of 2,850*l.*, and divided into 98 lots among 41 shareholders. Thus, by means of this society, building land at a first cost of 10,455*l.* 17*s.* 1½*d.* has been purchased and divided at the same cost into 329 lots, amongst 171 shareholders. But even these figures do not represent the numbers of persons among whom the land has been divided. The fact, that the allotments were too large for many of the original allottees, has led to divisions and subdivisions of them in great abundance; and, in some cases, land allotted by this society at an original cost of 1*s.* 1*d.* per yard, has been re-sold at 10*s.* per yard, and the average price at which it now sells is 7*s.* per yard. The land thus procured, together with other land brought into the market at a comparatively low price, created a necessity for building funds. Industrious thoughtful men began to see how much by care and economy they could accomplish, and to apply themselves in real earnest; and, as the result of their intelligent enterprise, we have as it were, three separate new towns created, and a fourth, now in course of erection. Dresden contains 505 houses, owned by 168 individuals, estimated at an annual rental of 6,000*l.* Eastvale contains 270 houses, two manufactories, and two mills, together owned by 102 individuals, at an estimated rental of 3,161*l.* 6*s.* 9*d.*, with a population of 1,500 persons. Bridge Street contains 95 houses, owned by 27 individuals, at an estimated rental of 665*l.*, besides Woodhouse, Anchor Ground, Ashwood, and other places in which no erections have been made. At present there is scarcely a foot of building land to be obtained at any price within the precincts of the town proper.

"The extent of these building society operations may be guessed at from the following statistics :—

	£	*s.*	*d.*
"They have advanced upon mortgage securities - - -	211,640	16	3
"Paid on completed or withdrawn shares - - -	40,925	18	1
	£252,566	14	4

"The number of shareholders by whom this amount has been paid is 1,914, and the number of the shares 47,898½. These transactions, too, are totally independent of the land society's operations, and of the building societies in existence before 1850. Besides all this, the enormous sum of 131,797*l.* 12*s.* 8*d.* has been invested in these societies by way of deposits, which further proves, that members of building societies are not the only provident people in the district. There are now, in fact. more than 1,400 subscribing members to building societies in the town, looking anxiously forward to the day when their own homes will repay their prudence and economy."

The simple fact of these savings being effected, and of these houses being erected, by the will of working men, is an immensely significant one. All these owners of houses are freeholders; and every man has earned his own freehold from a desire to possess it. Whilst in the same locality, employed at the same work, earning the same wages, and without any extraordinary drawback, a vast number of those who possess no such properties, live on from day to day, regardless of every enjoyment which is not sensual; exhibiting no desire for an elevation of character amongst their fellow men, wasting their money in profitless pursuits, or in degrading pastimes, and being for ever unprepared for the commonest vicissitudes, which bring such misery in their train.

Then Mr. Palmer, after presenting the bright side of the picture, very fairly shows the other side also :—

"To attempt to set up the dogma that we are all provident people, would be a glaring fallacy. Wherever there is excess of any kind, there will be found improvidence ; and in Longton, it must be honestly admitted, that improvidence developes itself in many forms. Amongst a large class of men, whose facilities for personal, domestic, and social elevation are great, there is a strong vitiated tendency. Whilst their weekly means hold out, they revel in excess. They freely eat, drink, and take their pleasure. Very often they earn their money like slaves, and spend it in the most lavish manner. When they get hold of it, they are in an intense hurry to dispose of it. They appear to have no conception of its value, except so far as it may secure their present gratifications, and never dream of providing for future contingencies. They leave that department of social science for the special consideration of parish officials. They neither understand the theory nor the practice of economy. Their lifelong creed is 'sufficient unto the day is the evil thereof.' So there exists a class of men, of whose virtues we can say but little, but of whose want of virtue, volumes might be spoken. The tattered, sallow, begrimed aspect of these men, the forlorn condition of their poorly clad wives and half-naked and half-starved children, and the abject wretchedness of their filthy and ill-furnished homes, are features peculiar to this type of humanity, which excite both pity and disgust.

"Towards these deplorable evils, it is to be be feared, that a portion of the female community contributes. Amongst the class to which we refer, there is a glaring neglect or ignorance of home duties, and utter incapacity to manage well their household affairs. Dirt, disorder, and discord are everywhere present. The husband finds no comfort in his home, and little or nothing to enlist his sympathies, and consequently seeks pleasure and comfort elsewhere. Home becomes gradually neglected, forsaken, hated. Excesses creep upon him, and, at last, an odious reputation attaches to him, which shuts him out from the companionship of respectable associates.

"In ameliorating the condition, and improving the moral, mental, and social position of this class, there is a wide field for the united co-operation of all Christian men of every creed. Very much doubtless has been done, but there is a greater work yet to be done; and, I may add, that there never existed a greater influence for good than now.

"Drunkenness is at this time, perhaps, the most generally demoralizing form of Longton depravity. From robbery and violence we are well protected by a vigilant police, under most excellent management and supervision.

"Prostitution, as compared with some other places, is scarcely known here, for it is stated by one, very well informed on the subject, that there are but sixteen known prostitutes among us, and some of these not wholly dependent upon their nefarious trade for a living."

This is what Mr. Palmer writes of Longton in 1864, and though we may not absolutely say of the other towns "*ab uno disce omnes*," yet much of what has been written of Longton applies not only to the Potteries, but to much of South Staffordshire also, of which I shall say a few words before I close my report.

What strikes one most forcibly, is the great lack of any middle class of workmen, between those who appear to be utterly improvident and wasteful, and the "careful," prudent, and energetic men, of whom Mr. Palmer has spoken with so much force, who thrive well in business, and to whose thrift is owing mainly the great number of freeholds round about. The men appear to be all thriving and saving, or else in want, except immediately on the receipt of their wages; and it is to this latter class to which a considerable number of the wage population belongs. To use the expressive language of a workman, to whom I was speaking on the subject, "there is no set of workmen among "the potters who will wash and dress themselves after a 'day's labour, go out and smoke a pipe, have one glass and no "more, and then go home. They are all either thoroughly "for home, or all against home." How many excuses do the drunkards make for the holydays which they keep. Saint Monday has hitherto been a very patron amongst them, and is, by some, absolutely idolized. On his day occur all the weekly rabbit races, dog races, and hop-step-and-jump matches, for sums which, to an agricultural labourer, would be a year's maintenance for his whole family. If they hire at Martinmas, an old-fashioned condition of labour which is still retained in the Potteries, they "wet the bargain" till it is drenched through and through. If there is a "wake," they keep it for a week. In short, whatever can be converted into an excuse for a break off, is adopted as a matter of course.

Under these circumstances, the homes of such people, what are they? "What I should call a comfortable and well furnished house," says an informant who is in the habit of visiting them regularly,—

"Is scarcely ever to be found amongst this class. The furniture above and below stairs is, generally, of the poorest kind. The women, from going early to work, have had but few opportunities afforded them of becoming acquainted with home duties before they marry; and in consequence, their homes are deserted by the men for the public house.

"In those parts of England with which I am familiar, I have never met with girls and women who knew so little of the common use of the needle, as in Longton. Hence the rags which disgrace the children, and the great waste of money which is caused by the want of a few stitches in time. Even the children's under-clothing is often bought ready made, and worn till it will no longer hold together.

"The same waste and extravagance goes on with the food. At the beginning of the week I have seen often, meat, fish, spirits and beer, where, three days afterwards, there was only bread and water. A full stomach during the early part of the week, and an empty one at the end of it, is a very common rule.

"Education, I consider, to be at a very low ebb amongst them; rather better amongst the women than the men. But, in most cases, even the simplest reading and writing is most imperfect. Any person, however incompetent, who has opened a 'cottage school' as it is called, is blindly trusted by the parents with the all-important first few years of a child's life. What little it learns too, is soon forgotten when it goes to work; its only chance of seeing a book usually being at the Sunday school.

"Unchastity, so far as I can judge, is not a common vice amongst the potters. Drunkenness and ignorance, which latter is more a misfortune than a fault, are the present great evils of which society has to complain, for neither of them are considered a disgrace, even in these days of progress."

Rags and comfortless homes certainly stand everywhere in prominent relief, in many of the wealthiest districts both of North and South Staffordshire, where the wages of the family often amount to 3*l*.. 4*l*., and 5*l*. a week. I have been told of an instance, in South Staffordsire, where the family wages were as high as 6*l*. a week, and where a prepayment of them was necessary, in consequence of extravagance, before the Saturday night.

Then, as to to the effect of such examples upon the children, of whom, perhaps, as many as 90 per cent. never go to school, and do not know what instruction or discipline is. We know what that must be, and how the condition of life in which they are brought up, is continued and exaggerated with their growth into man and womanhood! Need I then say any more to show, what work lies in the future for the regeneration of districts such as these. Here are desolate homes, destitute though rich, where there are incomes, not only sufficient to bring up, but to train the families of educated men who pay poor rates for the maintenance of such wasteful people, when dissipation has done its work. Here are women who do not know what women's duties are, and who bring no attractions to the domestic hearth, whereby to draw the husband from other scenes, and from habits of dissipation. Here are men, who might be so well and comfortably off in life that want might be a word unknown; and here are children, with the spark of intelligence ready to be struck, but with so few kindly hands to strike it, that it remains unlit for ever. And so it appears to me that the Potteries have been but another unit in the mischief which arises out of the absorption of all the labourer's time in the production of that wealth by which we are to become commercially great, at the cost of nearly every religious, moral and intellectual obligation which the possession of it should only the more strengthen us to foster and uphold.

THE SCHOOLS, PUBLIC AND PRIVATE, AND THE EDUCATIONAL CONDITION OF THE POTTERIES.

I have taken some pains to ascertain the number of all the schools in the potteries, both public and private, including dame schools, and I have had returns which have given the principal known schools. But, with the exception of Hanley, I do not consider any that I have received, sufficiently accurate to quote them. From Hanley, however, I have been favoured with a return, kindly obtained for me by the police, which, I believe, includes all the schools within the borough; and with the exception of Longton, probably affords a fair criterion of the general educational condition of the districts, at this moment.

Thus there are belonging to—

	Public.	Private.	Scholars.		Total.
			Male.	Female.	
The Church - -	10	18	1,001	937	1,938
Roman Catholic -	3	0	138	140	278
Wesleyan - -	1	15	265	304	569
New Connexion - -	3	0	115	109	224
Baptist - - -	0	1	12	30	42
Independent - -	4	10	335	349	684
	21	44	1,866	1,869	3,735

Of the total number of schools, namely 65, 44 are kept by women, as private schools.

Of Sunday schools, there is, I have no doubt, in each neighbourhood a fair share. Happily there is not now the necessity for Sunday schools that existed 30 years ago, when there were scarcely any day schools for the working classes; for we have almost everywhere admirable day schools, where children may not only be well educated, but where they may be also taught their duty on the Sabbath day. My friend Mr. Palmer is eloquent upon Sabbath schools in Longton. But to my mind, the very creditable Sunday school attendance in that town, is only a proof of the barrenness of its day school accommodation. Speaking of the Sunday schools, he says: "They are, as yet, important auxiliaries to religious teaching." One might readily believe, indeed, that the education in Longton is due to them; but the time will come, I hope, when the number of day schools will be increased, and when a real education will supersede that which Sabbath schools are only able to afford. Mr. Palmer is quite right, and fully alive to the value of what he says, when he adds,—

> " I do not for one moment insinuate that the Sabbath school does, or can, by any possibility provide for the full and satisfactory secular education of the young. Far from it. But in the absence of more complete educational facilities, the Sabbath school has worked wonders. There are at the present time 1,705 male scholars, and 1,941 female scholars, making a total of 3,646, in them; and there are 177 male and 166 female teachers, being a total of 343 persons engaged in this noble work: and the public collections made for their support during 1864 amounted to 300*l*."

But in referring to day schools as one of the foundation stones of social intelligence and progress, he says,

> " I regret to say I am limited in my illustrations. Certainly some excellent public schools and many private elementary establishments have from time to time flourished here. Now and then, schools have been attempted to be established and have received an impulsive support, but it has not been continuons, and after a time has subsided into indifference. This is perhaps, one of the natural results of an originally uneducated people, whose estimate of intelligence must grow with education. So far, Longton has never been remarkable for a well letteredpopulation. The people have, nevertheless, turned what knowledge they had to the best account, so much so, that with two or three exceptions, every manufacturer in the town has risen from the workman's rank."

There is yet existing a "select school," in which I believe the elite of Longton and the neighbourhood have almost all been educated; not of this generation, but of the last, and those which preceded it. It is yet termed a select school, and musters about 50 boys.

You are aware, Sir, that when the Factory Acts Extension Act was about to be put in force, I apprized you of the real deficiency of school accommodation in Longton, and that I asked your permission to establish a day school under the provisions of the Factory Act, to which you kindly gave me your consent; for I saw that the deficiency of accommodation was real, that the two or three good schools which were open were more than full, and that empty rooms were very difficult to obtain. After the receipt of your letter, I entered into negotiations with the trustees of Zion Chapel, who were in possession of the only appropriate building I could find (which was only used as a Sabbath school, and therefore at liberty on week days), for the use of one of their rooms. That negotiation ended in an agreement for a year.

I then proceeded to the training school at York for a master, and was most kindly seconded by the reverend principal, who recommended to me his best master, whom I engaged. I was thus prepared to meet the grand objection, which, in Longton everywhere presented itself, namely, " that the half-time system never could be carried out, if " for one reason only and for no other, that there were no " schools into which the children could be crammed, even " if the masters would employ them, and that was doubtful, " as they would have to attend in their potter's dresses." I am happy to inform you that my school works admirably, and promises to be a great success. Already, and it is only a month since it was opened, it numbers 52 boys, half-time, and is increasing daily; whilst in the girls' school adjoining, there are also about 56 children, and both sexes are under a discipline to which they have hitherto been unaccustomed. A working man gratified me very much a while ago, by expressing his opinion that "already he saw an improvement in the demeanour of his workers."

It is not however in Longton alone that the half-time system has shown evidences of vitality, but in the other four districts as well, in all of which, the same assurances of want of room were given at the outset. Thus one gentleman writes,

"I am glad to inform you that the managers of the above schools will make the most efficient provisions in their power for the benefit of the half-timers. We do not propose to establish distinct schools for this class of children, but prefer their being introduced into our existing schools, and we shall make a vigorous effort to bring the schools up to the high standard maintained by our schools throughout the country. I was at ——— last week, and engaged one of the most efficient masters our training college could furnish. I think we can provide for 1,000. I am very glad that the Act has been introduced into the Potteries, and wish you all success in the speedy and complete application of its wise and benevolent provisions. In a few years there will be a marked improvement in the character, position, and prospects of the working potter; and you may rest assured that as far as the educational part of this great process of improvement is concerned, we shall try to make our school arrangements so complete, as to prove there has been no lack of disposition on our part to welcome and really educate the youthful workers."

Another says, "I have the pleasure to inform you, with " reference to the additional school accommodation re- " quired by the introduction of the half-time system into " the local manufactories, that we are prepared to receive " an additional number of scholars; one hundred and

" twenty, may be admitted at once, and should the " number of boys approximate to 100, a master will be " engaged specially for them."

So many similar announcements were made to me by the close of the year, that on the 10th of December, I issued the following advertisement:

"Education of half-time Children in the Potteries.

Several inquiries having been made of me with respect to the schools to which half-time children in the Potteries may be sent, I shall be much obliged to those persons who have school accommodation in the Potteries proper, and intend to appropriate it for the benefit of half-timers, if they will communicate to me within ten days from this date, for public announcement, the addresses of their various schools, the number of children that they can accommodate, whether such schools are or are not under Government inspection, the course of instruction pursued, and the terms per week on which the children will be received.

The postage of letters need not be pre-paid.

ROBERT BAKER,
H.M. Inspector of Factories,
10, Whitehall, London, S.W."

Subsequently I issued the subjoined placard, sending two or three to each employer for distribution, with a view to afford to all concerned, every information in my power on this subject, and to leave everybody without excuse as to where their half-timers might find school accommodation.

EDUCATION OF HALF-TIME CHILDREN IN THE POTTERIES.

In reply to my Advertisement of the 10th of December last, the following Schools are now prepared to receive Half-Time Children.

AT STOKE -	The Stoke-upon-Trent National Schools, under Inspection.—Course of Education usual in National Schools. 1—Boys } at Stoke. 2—Girls } at Stoke. 3—Girls and Boys under 10 years of age, at Mount Pleasant. 4—Girls and Boys, ditto, Cliffe Vale. 5—Girls and Boys, ditto, Boothen.	Charges, 2*d.* a week each child; but if the employers contract for numbers, this 2*d.* will be reduced to 1½*d.*
„	Private School; Principal, Mary Taylor; room for 12 girls.—Knitting, sewing, reading, writing, and arithmetic - - -	Threepence a week.

At Stoke	Private School; Thomas Robey; room for 20 boys.—Reading, writing, arithmetic, grammar, geography, book-keeping	Sixpence a week.
At Fenton	Fenton Church Schools, under inspection; room for 50 boys and girls.—Course of education usual in national schools	Charge 2*d.* a week, but under contract, 1½*d.*
At Hanley	National School for boys, Cross Street; under inspection; room for 200.—Usual course of national schools	Ditto ditto.
„	National School for Girls, Lichfield Street; under inspection; room for 160.—Usual course of national schools.	Ditto ditto.
„	National Schools (Wellington): 1—Central school, St. Luke's Street; under inspection; room for 100	Twopence a week.
	2—Joiner's Square; under inspection; room for 200	Twopence a week.
„	Wesleyan School, under inspection; room for 200; usual course of education	Twopence a week.
„	Bethesda Schools, under inspection; room for 200	Twopence a week.
„	Commercial School (Private), New Street; Thomas Mellor, principal; room for 80.—Reading, writing, and arithmetic	Threepence a week.
„	Gate Street (Private); Maria Sedgley, principal; room for 12 girls.—Reading, writing, arithmetic, elements of geography	Threepence a week.
At Etruria	British School (behind the Wesleyan Chapel); under inspection; room for 40.—Usual course of education in national schools	Twopence a week.
„	Unsectarian Schools; under inspection; room for 60 girls.—Reading, writing, arithmetic, grammar, geography, sewing, &c.	Twopence a week.
At Shelton	National Schools; under inspection; room for a considerable number.—Usual course of education	Twopence a week.
At Burslem	Burslem National Schools; room for a considerable number.—Usual course of education	Twopence a week.
„	Wesleyan Schools; room for a considerable number.—Usual course of education	Twopence a week.
At Tunstall	Wesleyan Day Schools, under inspection; room for 200 boys and girls.—Usual course	Threepence a week for the higher classes and 2*d.* the lower.
At Longton	Factory National Schools, Zion Chapel Rooms, Commerce Street; under inspection; room for 300.—Usual course of national education	2*d.*, and 1½*d.* when under contract.

At LONGTON -	Lane End National School; room for a considerable number of boys and girls - - - -	2*d*, and 1½*d*. when under contract,
,, - -	The Rectory Girls' School, under inspection; room for 160 girls.—Usual course, including drawing	Twopence.

ROBERT BAKER,
Jan. 2nd, 1865. H.M. Inspector of Factories.

The feeling with respect to the combination of labour and education in the Potteries varies, as may be imagined, very considerably. With some of the employers, a desire to promote the education of their workers has got the better of their needless fears with respect to the trouble that it might occasion them; and they have set themselves to the work with the most praiseworthy energy to promote it. I think they see already that it is likely to be beneficial to them in point of discipline, and to society in point of manners, as a whole. There are others who look upon the question as one solely of money, and of "who will have to pay the schoolmaster; and what business this additional trouble had to be imposed upon them?" There are a few who are wholly indifferent to both the law and to the principle of education, and who profess to be "waiting to see what their neighbours do," and what may be the possible consequences of not doing; who talk of "getting up monster meetings to petition Parliament," if not for the repeal of the whole law, at least "for such modifications of it as may suit them," and what they call "its oppressions and grievances." All the old stories of 1833 and 34, of which 1864 would be utterly ashamed in the textile districts, are reiterated again and again by them. But, upon the whole, I am quite satisfied that the good work is thoroughly getting into operation; and if it is allowed to work quietly and patiently, most of the evils consequent on the pottery system hitherto will be amended. I had never any doubts about it, beyond those which are ever certain to arise upon the introduction of new, and especially of compulsory, measures; and I have put them all aside, knowing that every day will only more and more develop the advantages of the Factory Act to both masters and workmen. For, I know, that, as education advances, the vices and bad habits which have attached themselves to the potter's character, will give place to more rational enjoyments; and that the next generation in looking on the past, will compare their condition with that of their predecessors, with the deepest gratitude for the law by which it was amended.

I want, however, the people, and the parents more particularly, to value the infant school; to evince a desire of their own for education by placing their children early under its advantages; and to feel, that it is a parent's essential duty to exert himself additionally for an object which may have such an important bearing on the future of his offspring. Lamenting their apathy, an intelligent national schoolmaster thus has written to me:—

"The children of ordinary workmen, I find, are often sent to work at eight years of age, and in my school more than one case has occurred within the last four years, where boys even of seven years old have been sent. In many of these cases they work with their own parents. Boys frequently return to school because they are not tall enough or strong enough to do the work. For these reasons they will frequently be discharged from as many as three places successively, before their parents will again send them to school, even though their stay is mostly only for a short period, and their attendance very irregular.

"On remonstrating with such people the reply has frequently been, 'His father does very well without learning, and why should not he:' Sometimes poverty causes parents to send their children thus early to work; but it is frequently done when both father and mother are at work also. Thus, the greater number of children in my school (and I think my school is a fair specimen in this respect) never reach the second or first class, but go to work from the third, fourth, and last class.

"This fact accounts also for the large number of children that pass through a school in this district in a year. In mine, the average attendance is just over 100, and yet the number of children who have received instruction during one year is very considerably more than 200. The children of classes 1 and 2 are generally those of shopkeepers and the better class of workmen; are more regular than the other lads in their attendance, and remain to ages varying from 12 to 14. These two first classes are generally well filled, so that really thoughtful workmen are not so scarce as some have said. In several schools that I know, the two first classes are decidedly the best filled in the school. Moreover, the parents of these children, if satisfied with the children's progress, will pay willingly a good school-wage, which I consider 6*d*. a week to be for this district."

This parental apathy, or greed, is the secret why, so large a number of the potters' children are kept without the influences of education; and that as the fathers die off the sons fill their places, and keep up the reputations which they vacated. And it is for these reasons, too, that our best efforts should be directed to operate upon the very youngest of their successors; for at a certain growth, the conversation and general ideas of a potter's child are something fearful. "One may readily "know," says a writer to me, "what is the nature of the "usual conversation at home, by the language which even "little children use at school."

You may not remember it, sir, but I may be permitted to recall it to your recollection, that in my Report for October, 1861, I stated, as one of several corollaries, based upon facts collected in various schools scattered over the whole of my district, that when half-timers have attended school before being sent to work, they make nearly equal progress in education with whole-day scholars; but when they have not been so sent, under the most favourable circumstances, equality of progress is only the result of a higher average age over the day scholars. I believe that this corollary has never been gainsayed. The Children's Employment Commissioners did me the honour to quote it, and it has had ample opportunities of being fully tested by any adversaries. Further experience has only more and more convinced me of its truth; and the value of infant schooling is, therefore, in my mind, materially enhanced.

And, indeed, with our present demand for female and infant labour, in consequence of the increasing ingenuity of our mechanism, infant schools and night schools must become the very germ of intellectual progress for the working classes. Happily they are fostered and encouraged by persons destined to the work by the finger of Providence; persons whose lives are actively spent on all the causes of developments, which men engaged in business pursuits neither contemplate nor foresee.

I do not enter into the question of the age at which persons marry in the potteries, though it would have afforded me a larger aggregate for my argument; but I confine myself to the one fact, that 10,598 women above 18 years of age are employed in one branch of industrial life alone, within an area, the diameter of which, does not exceed 8 or 10 miles; and that many of these, if not the greater part of them, are wives, if not mothers. Neither does my question refer, at the present moment, to the comfortless state of the homes of the husbands of these wives, nor to the consequent estrangement of the husbands from them, nor yet to the infant mortality of the district; but simply and solely (with the recollections which have run through some of the preceding pages of this Report as to what the prevailing vices of the district are), to the general condition of that infant population, which is necessarily left during their earliest years, whilst the mothers are away, to a minimum of care to prepare them for a maximum of work, as soon as they have physical strength enough to run a mould or turn a jigger; and thus to form a truly Arab tribe, formidable even in this infant state, but becoming still more formidable as life advances, unless watched over and defended and instructed by benevolence and philanthropy.

Thus in Longton, where this Arab life is indigenous, Mrs. Adam Clarke, the widow of the son of that Adam Clarke whose name and memory are household words in English homes and on English tongues wherever the Gospel light is spread, has established at her own risk of cost, "nursery schools," in which these infant Arabs are received, tended, sometimes fed, cradled, exercised, and instructed in all the elements of knowledge that they are capable of, preparatory to being received into the infant schools, over which her son, an Adam Clarke of the third generation, now the rector of Longton, exercises a supervision. I will not, however, attempt to describe what Mrs. Clarke herself has been good enough to detail to me in much more appropriate language; but I will give her own exposition of a subject at the present moment so deeply interesting.

"You wish me to describe minutely the very simple plan, or rather experiment, of our nursery schools in Longton. I will do it in the spirit and to the letter of your request.

"Upon my son's coming into residence last year, 1863, as rector of Longton, he found the younger children of his parish literally nursed and educated in the streets, in consequence of the great majority of the married women working in the factories. These children were habitually put out at a month old to often incompetent old women, or were left at home, when just out of arms, with elder brothers and sisters, no matter which, to mind them. In Longton, owing to the great demand for female skilled labour, and the fact of the long apprenticeship requisite for the china and earthenware trade ending only just about the time of their marriage, there appeared to be no immediate prospect of any change that would keep the wives and mothers at home. Such being the case, my son's first work this year was to prepare and get up an infant school (there being none in the parish), in which we had very shortly upwards of 140 children, taught by a trained mistress from the Home and Colonial School. Notwithstanding this, however, the streets seemed almost as full of children as ever. When I came, in April 1864, to give such help as ladies can best give to the difficult and laborious work which my son had undertaken, I found my experience gained as a clergyman's wife in the South of England wholly at fault in the face of the heathen ignorance of the parents, the utter absence of all knowledge of household duties and household management amongst the women, old and young together, and the appalling state of neglect and suffering amongst the infants and very young children, together with the sad indifference of the mothers to the consequences of such neglect. One summer afternoon in July, I had the curiosity to count the little children in the streets during one of my limited course of visits, and found them to be above 200. This was during, not out of, the usual school hours. They were therefore evidently so many 'waifs,' not claimed by any existing schools. During the following week three accidents occurred among them. One infant was burnt severely, another was severely injured by a kick from a horse which it was creeping under, and a third was maimed by a waggon wheel passing over it. In the following week the first of our nursery schools was opened.

"I ought to allude to another great evil which appeared to me to be consequent on the habitual absence of the mothers from their homes, both needing a remedy, and capable of remedy to a very considerable extent, I mean the injury to the young nurses themselves, left for 10 or 12 hours in charge of 'baby,' or the 'myth baby,' without any eye to watch over them, or any mother's help to enable them to fulfil the unfit task. These young nurses sometimes become deformed, or are the cause of deformity in the little ones by the unnatural strain on either of them, during so early a stage of their growth. And to this must be added, not only the total loss of time taken from them, which might possibly be devoted to their own improvement, but also the positive mischief of such a street training, just before the period when they themselves ought to go to the factory to begin their own work life. The objects which we, therefore, proposed to ourselves, by the nursery schools were twofold. First to let these little nurses, and their charges, come at once into care and shelter together, providing for the elder ones suitable means of instruction of which they might avail themselves, while their little ones were being amused with gallery lessons, singing, games, and exercises, or put to sleep in comfortable cradles. Thus, without at all withdrawing the older children from a duty which it was theirs to discharge, our endeavour should be to make that duty easier; and instead of being burthensome, to teach them to perform it cheerfully and well. At the same time too, we wished to teach them to value their own class lessons, and to estimate the value of every spare moment, and to turn gladly whenever they could be spared to needlework, reading, or writing, &c., and so in practice, we find that to these children, two thirds of their time is given to their own self improvement, and the remaining third is well spent in drawing closer instead of loosening, the ties of affection, as well as the sense of dependence on the one hand, and of fostering care on the other, very important to be encouraged, and cultivated between brothers and sisters situated as these are, so that they may in some measure take the place of the mother's care drawn alike from all the family.

"Under proper management, it should be just as easy to make it a subject of pride and pleasure in a nursery school, that the infant belonging to any boy or girl should be brought clean and tidy, that it should walk well, be a bright good tempered child, evidently fond of its young nurse, as it is to excite emulation to excel in the best copy or map; and if this can be accomplished, we are certainly bringing in a powerful lever to aid in improving the home welfare, physical and moral, of our industrious classes, and in combining with it sound and efficient instruction, we supply an additional lever to the education of those who have been necessarily excluded from it.

"The secret of success, so far as my experience tests it, seems to lie in strictly avoiding centralization, in keeping to simplicity of plan; to the idea of nursery schools in cottage homes, and in a very careful selection of the person who is to keep perpetual oversight over the nurse teachers placed in charge. Each nursery school should be filled from its own adjacent streets, courts, and roads; and all its arrangements should be such as will economise space and time. and make the best of minor difficulties. These are invaluable lessons for the comfort of the cottage home, but not easy to be learnt, when the only training a girl gets is in the large well ordered central school, where everything must give way to the high pressure system, inseparable from the necessity of accomplishing a great deal in a very short time.

"The nurse and teacher is, in all cases, the mainspring on which all must rest. She must be a kind, matronly, sensible woman, capable of exercising a beneficial influence on all within her reach, sufficiently on a level with the families around her, to understand and sympathise with them, yet raised above them by her own learning, and by the support of her clergyman, to render her advice not only of value but to be held in request. She should be competent to give counsel in any little children's illnesses, and to encourage both parents and children to come to her in any emergencies or troubles, which may fall within her province. She must be very patient and gentle with little ones, but at the same time sufficiently well educated herself to give thoroughly efficient instruction to the elder children, and to any hired nurse girl placed with her.

"Such women may not be easy to find, but still they will be forthcoming when wanted, whenever the real condition of a parish is known by house-to-house visitation; because it must be remembered that the encumbrances which would unfit many desirable persons from taking charge of any regular schools, are no longer objections in a cottage nursery. We have over five such nursery schools at work in Longton, and our staff of teachers and assistants is as follows:—There are five chief mistresses, a duenna housekeeper (one of the nurses being a young widow of 19, partially blind, who was maltreated at home because unable to earn her own living, but who can sing songs, clean the house. and amuse little children), three paid monitors, and three nurse girls, who receive aid in clothing and small gifts, according to their duties. In the summer months, one strong girl of 12 takes charge of a basket carriage or perambulator, taking out the very weakly ones from two nurseries into the open country by threes, for two or three hours daily, after which they sleep in their cradles very soundly.

"The paid monitors, if chosen from a good neighbouring school, are very useful in giving help to the elder children, while the nurse teacher is employed with the Bible and gallery lessons of the little ones. Our nursery schools are now becoming so full, that more assistance will shortly be required, as their second object is to provide a shelter and refuge for numbers of helpless little beings just beyond babyhood, but still far too small and weakly to be safely trusted in our present infant schools. The piteous look and expression of the greater part of them can be distinctly traced to opiates, or to the results of accidents from neglect. In some, the hand or foot is withered from a burn; others are only safe (in consequence of injuries) by having chairs set apart for them in some corners where no rough movement or play of others may do more injury. In some cases children of nearly three years old can scarcely yet stand; imperfect speech and partial blindness are very frequent; so also are the cases where intelligence seems dormant, and yet the dull look is wholly distinct from the expression of idiotcy. In most of these cases I have found the influence of opiates in the shape of soothing syrups (afterwards acknowledged) by the old nurses to whom they had been entrusted when they were babies. One woman told me she found out that a regular portion of the money she gave for the care of her child went to the chemists; she took the infant away, but that is three years ago, and she is only now beginning to be like other children in her perceptions, and must still suffer for years to come.

"I have said that it is very difficult, but by no means impossible, to find these nurse-teachers. Out of those employed one only is very inefficient, and must be changed when a better can be found. Three of them are decidedly good teachers, as any average village schoolmistress. Even now, with only a few months superintendence, and each one of these is capable of becoming much more competent with time and practice.

"The improvement for instance, in them, by associating with them a really good monitor, beginning in the orderly routine of a well-taught class, soon becomes evident; while the monitor acquires a degree of patience, and of a ready power to make the best of inconveniences, which will be very valuable to her when she returns again to the more regular discipline of a pupil teachership under a certificated mistress.

"You see that I have in Longton somewhat of the task of making bricks without straw, no funds, no trained material, to work with of any kind, no help, beyond my own family. The lesson here is the same to all; we must make the best of a most deplorable state of affairs, and do what we can at once, instead of waiting to be able to do better at a future time. I find my teachers particularly successful in getting on the very backward children. Even if they could be admitted to the higher schools, they must necessarily be placed in the lowest classes; most of them could only take refuge in the infant schools; as upper schools cannot, in fairness to others, devote time to those who scarcely know the alphabet. In such a school they must necessarily be perpetually reminded of their deficiencies, and feel depressed and unsatisfied. In a nursery school class, each help the other. All have the common bond of not being wilfully ignorant, and of trying to learn as quickly as possible; and they are very glad to make the most of any help they may receive. In one of my best nursery schools they form a class upstairs by themselves, which is a thorough beehive of contrivances for lessons. The most forward have got on in six months to writing from easy dictation, making bills of parcels. Their needlework is really wonderfully improved. They generally read to each other whilst sewing; and if any of their little charges downstairs require to be nursed, they often ask leave to bring it upstairs to rock it off to sleep, so that they may not lose anything that is going on. To these hitherto wholly uncultivated minds also, the very mixture of the infant school methods of teaching, *i.e.*, by repetitions, by singing, by practices, &c., are all useful.

"The apparatus wanted for these schools must be the best of its kind, for the economy of the room and of the teacher's time, is all essential. There must be a small gallery for infants, a few forms, and several little chairs, cradles, a cot and a sofa for those beyond cradle size, a strong basket perambulator, a good work-table with drawers, moveable writing desks, two black boards, and a few well-chosen books, Deane's or Chamber's early standard revised code guide books, some pictures, and Bible stories, complete the chief requisities, except the furniture, for the teachers and monitors. An ample and regular supply of needlework is obtained by attaching to each school a clothing club of its own, teaching the elder girls thus to measure and cut out clothing for their own little brothers and sisters.

"Further, the principle I want to establish and carry out in cottage nurseries is, above all, to keep up the sense of some usefulness at home, in and through the school. A playground, and, if possible, a covered gallery of the cheapest materials, so that it gives shelter from rain and sun, should be indispensable to each house. We shall begin the year 1865 with the conviction that when more thoroughly organized, the nursery schools will form a distinct and important branch of parochial work. The trial has already proved that they will afford an honest means of livelihood to many women whose abilities and qualifications would be otherwise lost both to themselves and others; and that they will answer the purpose of giving a good elementary education to those who must otherwise remain in neglected ignorance, as well as be exposed to daily evil from street associations. From one nursery we were obliged to remove an interesting child of seven years old, to the babies' room for a few weeks, because she swore so constantly, apparently from mere imitation or habit, for in other respects she was a very good, tractable child.

"Of the teachers employed, all of them, so far, have been found here. The first was the young widow of 19 years old, of whom I have spoken. She was left a widow just before expecting herself to be a mother, and her parish pay being at once withdrawn, she must have gone into a factory, and been exposed to all its discomforts and evils, had we not given her this occupation. A few weeks passed under our infant schoolmistress enabled her to teach very little ones pretty well. None others were wanted to come to that nursery, as it is close to our other schools. Many of her little ones brought their dinners, and food to be made warm, and stayed all day long; such as the three children of a woman, who had to go out with her blind husband in a hawker's cart, and the children of a widower. The widower was so much satisfied with her care and kindness that he eventually married her, and so secured her for his own home. The rent of this cottage is about 5*s.* a week, including the rates. The average expense of each of the nurseries varies from 8*s.* to 14*s.* a week beyond the rent, according to the assistance required. As long as they are held in hired buildings they cannot be quite self-supporting, as the extreme helplessness of many of those we most wish to receive needs so much extra and unusual assistance whilst they pay only the small sum of 2*d.* or 3*d.* a week, as they do in the larger schools, according as there is only one, or more than one, from the same family.

"Another of our teachers was left suddenly and wholly destitute, with three infant children under five years old. Her husband become deranged, and it was necessary to remove him to Stafford Lunatic Asylum. I found her vainly endeavouring to eke out parish pay by needlework done at night, when her baby was asleep. A cottage was hired and fitted up; the half blind woman, hired to nurse her two youngest infants, and within a week, her nursery school was opened, and filled with 40 children within a month. She is now one of our best teachers; sings by note as well as ear, and possesses a good deal of general information, having been a farmer's daughter, and brought up at a middle-class boarding school. Whilst experiments are being made, mistakes or blunders will occur, which it is useful to find out and remedy for oneself. These nursery schools will therefore perhaps be kept another year in our hands. There cannot be any other way in which a small subsidy can do more direct and practical good in a parish; and the principle on which they are founded, must be a sound one, where married women who are young mothers work from home, and are thus unable to fulfil their own duties. Next year, if you wish to receive any particulars of progress, I hope the annals of the nursery schools may possess more of interest.

"I remain, dear sir,
"Yours, sincerely,
Matilda Clarke.

"Longton Rectory,
"December, 1864."

And most sincerely do I hope so too, for nothing has ever afforded me more gratification during my long connexion with the working classes, than visits to these nursery schools. Nobody sees their necessity more, nor regrets it more, and especially for these districts to which restrictive legislation has not yet been applied; districts where we see the exercise of power without rational discretion, and where the whole state of society may be compared to a locomotive engine when the steam has been got up, that has been started by the hand of mischief, without a driver, and runs away, knocking aside all the minor obstacles it may chance to meet with; and if not self overthrown, only stopping when either its fuel or its water is exhausted.

The plan which Mrs. Clarke has so successfully adopted seems to resemble in some of its parts, that which was suggested by Miss Burdett Coutts, in the Times of the 19th of January, and neither plan can fail to be productive of the most beneficial results.

With more particular reference to the education clauses of the Factory Act in the potteries, as I was unable to issue the abstracts till late in October, owing to their not being ready, I was also unable, and indeed unwilling to press the children into school till the beginning of the year. I began, therefore, first to familiarize the men with the half day system of work, requiring only that the children should not work the other half, and then I intimated, that after the 1st of January I should expect them to be sent regularly to school.

A month has elapsed since this direction was given, and I find that on the 31st of January there were 785 males and 318 females, making a total of 1063, at school on the half time system; a total which would have been more than trebled, had every master exhibited equal willingness to enforce the educational clauses of the Act.

It is however to the number actually now at school to which I am at present desirous of directing your attention, and to their educational condition on commencing; because as it appears to me, that condition, is indicative of the infant population over nearly the whole of Staffordshire, whether north or south.

I have had returns made of the half-timers, name by name, by the masters and mistresses in whose schools they are to be found, in order that there might be no mistake in the matter, that the test might be applied free from the hurry and confusion of work, or of the children's being called upon suddenly to answer when in the midst of their fellow workers, to show the capability of each child; and I think, Sir, you will come to the conclusion, that not only that which was stated to me by a master potter, on my first going amongst them, namely, "Well, however bad the factories

" were, when the Act was applied to them, they were not " so bad as the potteries are." was perfectly true, but that never was a case for legislative interference more fully made out than this for the potteries on educational grounds alone, independently of the physical fact of so many children of five years old being formerly employed therein.

The subjoined Table shows the educational condition of these children. The total number is 785 boys and 318 girls. Of these, 148 did not know their letters. 351 knew the alphabet only, 279 could read syllables, 236 could just read. 53 could read well, and 335 could write. With respect to arithmetic, 113 were in addition, 91 in subtraction, 35 in multiplication, and 43 in division and further. Of the whole number of girls, 163 could knit, and 226 could sew. It is clear, therefore, that of the whole number of boys and girls, 1,010, or 94·5 per cent. were in a state of utter ignorance.

I will make no further comment on this fact, otherwise than to observe, that if the state of any society is moulded by surrounding influences, as undoubtedly it is, some idea may be gathered of the condition of a population where so large a per centage is ignorant of the merest elements of learning. That it is so is undoubted, the misfortune being, that it is only a type of a vast class; and that the remedy now applied can be only very partial in its operation, and very slow of producing results. Nevertheless, I thoroughly believe that the present state of things is quite remediable; that thousands need but the opportunity of education and social influences to raise themselves to the height reached by many of their fellow workers, notwithstanding the obstacles and temptations which lie in their way. All that they want is instruction, guidance, example, and sympathy. They must be educated, and healthily amused: the beer house must be exchanged for the public park, and athletic games for dog fighting and rabbit hunting; ignorance and rags must be made to give place to schools and clothing clubs, gluttony and the burial clubs, to the savings bank and the building society. We must in fact teach them to provide for life, that they may live as men, and feel the responsibilities which belong to manhood. If all this is done, the next generation of potters will no more resemble the present than the present do their Saxon ancestors. I may be accused of prejudice in favour of the Factory Act, but with an experience of thirty years, with its original difficulties all overcome before me, and the evidence of its effects transparent through the perilous period of the last four years, it is excusable; and therefore I may be permitted to say, that though the Factory Act may not be a panacea for all the evils which I have seen amongst the potters, amidst an amount of good, nevertheless, which is quite refreshing, I feel that the foundation has been laid by the legislature of inestimable blessings for them in the future; and that whatever there may be in the past to condemn, must just be one of those bygones, to be forgotten, because soon to exercise no more influence, for ever.

Neither can it be said to have done nothing already, if it has but suggested an improvement in the system of stoves, if it has pointed to a means by which poisoning by lead may be neutralized, if not wholly, at least to a great extent, if it has paved the way for the preservation of life for the scourer and the ground layer, and has sent 1,000 children into national schools.

EDUCATIONAL CONDITION of the following Half-time Children when received into the School at from January 2nd, 1865.

Principal.

Places.	Kind of School.	Children.		Knows Nothing.	Knows the Alphabet.	Reads Syllables.	Reads.	Reads Well.	Writes.	Arithmetic, to what? 4 first Rules.				Knits.	Sews.
		Boys.	Girls.							Add.	Sub.	Mult.	Div.		
Hanley	Cobridge N.S.	21 —	— 2	3 —	4 1	6 —	6 1	2 —	14 —	4 1	2 —	— —	3 —	— —	— —
	R.C.	17 —	— 5	2 —	— —	13 3	— —	2 2	—	1 1	— —	1 1	— —	— —	— 1
	Northwood N.S.	15 —	— 11	4 1	3 1	4 3	4 6	— —	5 7	3 3	— 3	— 1	— —	— 9	— 11
	Wellington N.S.	—	19	1	3	3	11	1	15	7	5	—	1	6	6
	Etruria, British—Girls	26 —	— 9	2 1 deaf and dumb.	3 —	10 5	10 3	1 —	17 7	2 —	10 1	4 —	1 —	— 7	— 9
	Cross Street N.S.	44 —	— 16	— 1	13 4	12 6	12 4	7 1	21 6	9 2	4 3	— —	1 —	— 14	— 15
	Wesleyan	34 —	— 18	— —	26 9	4 4	4 5	— —	4 5	— —	1 2	2 2	1 —	— 4	— 8
	Bethesda, Day	68 —	— 6	18 —	25 3	15 —	8 2	2 1	5 4	1 —	2 —	5 —	—	— 5	— 4
	Joiner's Square	—	16	—	3	7	6	—	16	3	4	—	—	5	5
	R.C.	6 —	— 2	3 —	3 1	— —	— —	— 1	— —	— —	1 2	— —	— —	— 2	— 2

Educational Condition—*continued.*

Places.	Kind of School.	Children.		Knows Nothing.	Knows the Alphabet.	Reads Syllables.	Reads.	Reads Well.	Writes.	Arithmetic, to what? 4 first Rules.				Knits.	Sews.
		Boys.	Girls.							Add.	Sub.	Mult.	Div.		
Shelton	St. Mary's, Parochial	27 —	— 4	3 —	4 —	11 1	9 2	— 1	9 2	1 2	1 —	— —	2 1	— 4	— 4
Burslem	N.S.	43 —	— 12	10 2	17 3	9 —	7 3	— 4	11 6	1 2	4 4	1 —	4 1	— 9	— 9
	Wesleyan	76 —	— 36	11 8	23 15	14 3	25 10	3 —	13 6	3 4	3 3	3 —	7 —	— 21	— 28
Stoke	N.S.	59 —	— 15	— —	34 3	12 5	12 3	1 1	14 6	3 1	1 2	6 2	6 —	— 8	— 13
	R.C.	—	2	—	—	—	2	—	—	—	—	—	—	2	2
	Private	1	—	—	—	—	—	1	1	—	—	—	1	—	—
Fenton	N.S.	101 —	— 22	21 9	39 —	31 5	0 8	— —	21 11	11 6	5 2	1 1	4 1	— 16	— 21
	Mount Tabor	11 —	— 5	— —	6 3	5 —	— 1	— 1	— 2	— 1	— —	— 1	— —	— 4	— 4
Tunstall	N.S.	64 —	— 19	— —	44 6	9 —	4 9	7 4	20 10	2 4	6 1	3 1	1 —	— 15	— 19
	St. Mary's, N.S.	3 —	— 5	— —	— 1	1 1	2 3	— —	2 3	1 —	— 1	3 —	— —	— 5	— 4
	Wesleyan	38 —	— 19	7 2	7 2	10 5	9 7	5 3	27 14	9 3	2 1	2 —	— —	— 4	— 5

EDUCATIONAL CONDITION—*continued.*

Places.	Kind of School.	Children.		Knows Nothing.	Knows the Alphabet.	Reads Syllables.	Reads.	Reads Well.	Writes.	Arithmetic, to what? 4 first Rules.				Knits.	Sews.
		Boys.	Girls.							Add.	Sub.	Mult.	Div.		
Longton -	Factory, N.S. -	52 —	— 57	13 11	4 28	30 9	5 9	— —	2 6	5 1	5 9	— —	— —	— 8	— 42
	High Street, Private -	8 —	— 3	— —	1 1	6 1	— 1	1 —	— —	— —	— —	— —	2 —	— —	— —
	Lane End Old Church -	28 —	— 11	14 1	5 2	6 7	3 1	— —	6 6	2 5	1 —	1 —	— 1	— 8	— 10
	Wesleyan -	5 —	— 2	— —	— —	3 —	1 2	1 —	3 2	1 —	1 —	1 —	— —	— 2	— 2
	Normacott -	1 —	— 2	— —	— 1	— —	1 1	— —	1 1	— 1	— —	1 —	— —	2 —	2 —
	Total -	785 1,063	318	148	351	279	232	53	335	113	91	35	43	163	226

SPECIAL RULES.

In the Factory Act Extension Act there was enacted, for the first time to my knowledge, a power, by which, the employers were enabled to frame special rules for maintaining due ventilation and cleanliness in their places of business, and of enforcing them by penalties on their workpeople. In establishments of various kinds such rules exist as a matter of discipline; but the observance of them is a condition of employment, and not an enactment; and the penalties are permissive and not legally compulsory.

The utility of the legal power of enforcing rules, especially for ventilation and cleanliness, in workshops where both the temperatures and the employments are prejudicial to health from their very natures, and especially, where the labour performed, is done for the most part by contract and subcontract, and where the employer in a certain sense, becomes only the lessor, as it were, of the buildings, is unquestionable. But there are two great difficulties attendant upon it practically. The first is, that by the law as it stands, every master may make his own rules; and the second is, that a person unacquainted with the exact terms of arrangement between an employer and his workpeople, has small means of determining where the master's liability ends and the workman's begins, and *vice versâ*. Thus, unless special rules could be so formed as to be adoptable in a class of works, their multiplication might be interminable. There might possibly, also, exist a desire on the part either of masters or men, to overreach one another under the shelter of the law, and to require of each other to do that which it might not be their duty to perform, to the prejudice of the masters' property on the one hand or to the workmen's time or liberty upon the other. A loose apprehension of the consequences of disobedience, or a too stringent application of the power itself, require alike to be anticipated and provided against.

It was with a desire of preventing such a misapprehension by either side, that, on my introduction to the master potters by the Chamber of Commerce, and on referring to the power of making special rules, I suggested the desirableness of delegates from the workmen being invited to assist in the formation of special rules for the Potteries, with which suggestion they most readily complied. Accordingly, a meeting of two representative bodies, was convened within a few days, the one, consisting of 20 workmen belonging to the various branches of the pottery trade, and the other of three masters selected by the Chamber, at which certain rules were proposed and discussed; and a committee was formed to further consider the question. The result was, that I was eventually requested to transmit to you a copy of the following rules for your approval, which I had the honour to do on the 24th of November last.

The rules are as follow:

"1. The measures taken by the employer for the ventilation of the various workrooms shall not be in any way interfered with by the workpeople without the knowledge and concurrence of the manager over the said works.

"2. The various rooms in which the flat-pressers, hollow-ware pressers, throwers, turners, and moulders are employed shall be sprinkled and swept out every day by each workman in turn (or by his substitute), and all the other workrooms, except those for storage only, shall be swept out and cleansed at least once a week, by such workers employed therein as the manager shall depute to this duty. Each bench shall be washed down and cleansed once a week at least by the person employed ot it.

"3. In the saggar-houses, the floors shall be properly swept and sprinkled after every setting in of an oven.

"4. The steps and stairs up to and in the various workshops shall be scraped and clean swept at least once a week by one of the workers in such workrooms, deputed to his duty by the manager of the department to which such workshops belong.

"5. In every other arrangement for the general cleanliness of any factory, the person deputed by the employer to discharge any duty required of him or her for this purpose, and failing therein, shall be held responsible for such failure.

"6. Smoking in the workrooms during working hours is strictly prohibited.

"7. Dogs are forbidden to be brought on the premises by the workpeople.

"8. On any violation of these special rules, all the workers within any room in which such violation has taken place shall be responsible for every offence, unless previously to the infliction of any penalty for such offence, the real offender has been discovered.

"9. The penalty for every breach of the above rules shall not be less than one shilling, and not more than five shillings."

The only public expression of opinion on these rules which I deem it needful to quote, is taken from the *Potteries Examiner* (a workman's paper), of the 31st December last, to the following effect:—

"Of course, the foregoing will have to receive the sanction of Sir George Grey before they become law; and it is highly probable that he will not sanction the 9th clause with its heavy penalty of five shillings. It is monstrous to suppose that the slight omission of an hour's cleaning, or sprinkling, or scraping, or smoking, or the accident of a dog's attendance, should subject the workman to a penalty of five shillings, and sometimes the whole men of a shop to a similar penalty each. Such a power is barely second to magisterial power, and places a weapon in the hands of employers which might be most seriously abused. We most earnestly call the attention of Mr. Baker to this clause, to the end that Sir George Grey might have the inspector's opinion."

Since then, I have not heard of any objection having been made to these Rules though they are here and there supposed to be in operation. This much I know, that at the meeting referred to, there was a good deal of discussion on the two clauses which refer to smoking and the introduction of dogs; and many arguments were urged by both sides pro and con. The masters argued that smoking during working hours interfered with work, was a bad example to the children who frequently took to the habit whilst yet very young, and that it was often very objectionable to their fellow workers; and to bring the prohibition within the scope of special rules, they contended, that tobacco smoke affected ventilation, and spitting, infringed cleanliness. The men argued, that it mattered not to the masters whether they smoked or not, so long as they did their work; and the prohibition would be an arbitrary interference with their rights. Several manufacturers, who are themselves inveterate smokers, stated, that they never smoked on the works, although often there as long as the men, and that during meal times, and in the morning and evening, the men had plenty of opportunities, if they wished, to indulge this habit. The deputation of men to the masters represented that there was an almost unanimous feeling against the prohibition amongst the men, both smokers and non-smokers. Of the three who attended, two were personally as much opposed to smoking as the masters; but all three evidently regarded it as entrenching on their rights. There is, nevertheless, I believe, a very large majority of masters in favour of the prohibition.

With respect to the introduction of dogs into the workshops, perhaps less may be said with respect to the legal power of prohibition. As a matter of discipline, it seems one of those nuisances which ordinary firmness would remove.

As the rules are still "sub judice," I am unable to offer any observations on their practical working, or upon their fitness for establishments of a different character to earthware. As a whole, they seem to combine the principal benefits which it is desirable should be enforced for the purposes of ventilation and cleanliness, and, by a careful introduction of them, may be made to accomplish what they are intended for.

DRAIN AND SEWAGE PIPES.

I have referred to drain and sewage pipes, as having been withdrawn from the provisions of the Factories Act Extension Act. Up to a certain period of last year, supposing all such works to have been included, I had placed them under the law, and the opportunities thus afforded me, whilst inspecting works where these pipes were being made concurrently with bricks, of observing the condition of workers in brickyards in various parts of the kingdom, lead me to express my regret that they are not all included under the same regulations as other works where women and children are employed. I consider the employment of children in brickyards absolutely cruel, and that the degradation of the female character in them, is most complete.

The employment of females as brickmoulders in the south and west of England, is not nearly so extensive as it is in those Midland districts where ironworks prevail, and where, in consequence, there is a perpetual demand for adolescent and adult male labour, so that very few males are to be found in the brickyards, particularly in the fire-brickyards in South Staffordshire, for example. Hence, children of very early years are sent to the clay-yards, and are brought up amid scenes and conversations which are most demoralizing. One may, in fact, scarcely recognize, either in the person or the mind and manner of the female clay worker, a feature of the sex to which she belongs. I have seen a boy of five years old, working among two or three and twenty females, being "broken in," as they call it, to the labour. In one case, a boy of 11 years of age was carrying 14 pounds weight of clay upon his head, and as much more within his arms, backward and forward, from the temperer to the brickmaker, walking eight miles a day upon the average of the six days; and in another, a boy of 16 was carrying green bricks to the floor in the mould, weighing 14 pounds there, and 3 pounds the empty mould back, and walking 18 miles a day upon the average. I have also seen females, of all ages, nineteen or twenty together (some of them mothers of families), undistinguishable from men, excepting by the occasional peeping out of an earring, sparsely clad, up to the bare knees in clay splashes, and evidently without a vestige of womanly delicacy, thus employed, until it makes one feel for the honour of the country that there should be such a condition of human labour existing in it. I questioned one such group in a brickyard in South Staffordshire as to how many of them could read, and found that only one out of twenty was so qualified; and out of the whole number, she only had been to a place of worship on the Sunday previously, the whole of them being partially employed on Sundays, as well as week days in "battening," "turning bricks," or "earthing the kilns."

But lest my evidence should seem partial, or as only seen through the medium of inspectorship, permit a master brick-maker to give his own version of the story.

"I am a brick and tile manufacturer and sanitary pipe maker, in the neighbourhood of Tipton, midway between Birmingham and Wolverhampton, in a direct line from each. I employ about 50 workpeople, one half of whom are women and children. On principle, I am, however, opposed to the employment of women and children in clay works and have made many efforts to dispense with their labour, but have always found insuperable obstacles in that direction. Our system of working is much the same as on all similar clay works, in the South Staffordshire mining district; but the great demand for youths from 14 to 18 years of age, in the ironworks and collieries, compels the clay manufacturer to resort to the employment of girls, women, and the younger lads. Hence girls of 9 or 10 years of age, and boys of 9 find work with us readily. These are mostly engaged in carrying clay to the moulding benches, carrying bricks and tiles off to the drying sheds, and again from the sheds to the kilns or ovens, besides numerous other odd jobs, such as clearing away the scoriæ and ashes from the kilns, ovens, drying sheds, and engine, oiling the press dies, and moulds, &c., carrying bricks, tiles, and pipes to and from the presses and stamps, sweeping and clearing out the rubbish from the sheds, kilns, and clay-stove rooms, and taking the clay to the pug mills, and carrying it away again, to the store rooms or moulders, as it may be required. Those who carry away the bricks from the moulders are mostly girls from 9 to 12 years old. On an average, they carry 10 lbs. of clay, and a mould weighing 4 lbs. (14 lbs at each journey) say 2,000 times a day, 7 yards each journey;. carrying the mould back the 7 yards also 2,000 times; so that they each remove in one day of ten hours' work, 28,000 lbs. or 12½ tons, 7 yards, and 8,000 lbs. 7 yards; total 36,000 lbs., or over 16 tons in the day. Moreover the bricks when 'reared,' 'gormed,' or 'piled,' and when 'hacked' or 'walled up,' all require moving three times over, and in one instance are carried quite 7 yards. But this work is shared in by all that work for that particular moulding table. The moulder, who is usually a woman from 20 to 30 years old, and the two clay carriers, who generally are from 10 to 16 years old, assist; so that the portion of work performed by the carrier away may be taken as one remove or one-fourth of the same 28,000 lbs. weight, for seven yards distance, which added to the 16 tons before-mentioned, makes up a total of 28½ tons carried each day by a child of 9 to 12 years of age.

"Those who carry clay to the moulders, called clay carriers, remove on an average, about 20 to 40 lbs. of clay on the head, and about 10 to 20 lbs. in their arms; say one of 10 years old, carrying in all full 30 lbs. of clay, each journey of 40 yards, and traversing 250 journeys per day, removing 3½ tons a distance of 40 yards daily, walks 4½ miles in doing it and 4½ miles back; walks 3 miles in 'rearing,' 'gorming,' and 'hacking' the bricks, and on an average 2 miles going to and returning from work, giving a total distance traversed by the younger clay carriers, of 14 miles; likewise, this clay carrier does the same amount of work in removing the bricks to the 'gorms' and 'hacks,' as the carrier off does, namely, 7,000 lbs. carried 7 yards, so that in all she carries more than 6½ tons of clay daily fully 47 yards, and walks in all quite 14 miles per day."

"The elder clay-carriers are usually 14 to 16 years of age, and occasionally older, and on an average carry a load of clay on the head and in the arms of 60 lbs. weight, for an average distance of 50 yards, and the number of journeys per diem, 300. This gives a daily total of 8 tons of soft brick clay, carried 50 yards by this one girl, and a distance there and back of 17 miles. Add to this 3 miles traversed in 'gorming' and 'hacking' the bricks, and two miles in coming to work and going back home, and we arrive at the conclusion that the elder clay-carriers, of from 14 to 16 years of age, walk 22 miles daily at their work.

"But besides carrying the above amount of clay 50 yards, they also do a great part of the work of carrying the made bricks to the 'hacks' and gorms. This part of their work would be equal to carrying one ton more clay the entire 50 yards; so it may be assumed as a fair average, that they carry 9 tons of clay 50 yards, and walk 22 miles to earn a day's wage amounting to not exceeding 1*s.* 6*d.*

"The moulder's work is not so heavy. She stands at the moulding table, throws the lump of clay into the mould, squeezes it in, then planes it off level with the open mould, with a lath-like piece of wood, about a foot long, and in the course of the day lifts, moulds, squeezes and planes, and helps to 'tap, 'gorm,' 'batt' and 'hack,' some 8 tons of clay each day. The children who carry clay to the tile and quarry and front brick and best goods moulders, have comparatively light work; say, for girls 10 to 13 years old, an average of 5 tons of clay carried 20 yards; and the carriers away of the tiles, quarries and front bricks, being of similar age, bear similar weights say, to a distance of 10 yards.

"In speaking of work, weights, distances, &c. as above-mentioned, I have only referred to my own particular manufactory, though what is true of these works is a fair average of all.

"The moral evils consequent on the employment of women and young girls in clay works, are very serious, very general, and most disastrous to their well-being, from whatever point of view it is looked upon.

"As a rule, not one in ten of the women and children has been taught to read and write, nor have above one half of this small proportion ever entered a school. In their poverty and need, their parents have sent out these little tiny hands to carry clay and set down bricks, all day long from 6 a.m. to 6 p.m. all the week through; plodding with clay-loaded heads and arms, to and fro, over hot drying stones, bare-footed and ragged. The other girls and women have for the most part, been recruited from these young toilers, labouring year after year at clay-carrying or brick piling, till qualified by experience to take the more lucrative and generally coveted post of brickmoulders.

"In many cases I have found that the young children belong to widows, some of them of deceased miners; some having neither father nor mother, but finding a home with some of those kindly affectionate working people, whose rough but tender acts of hospitality and sympathy are the best redeeming feature of the working classes. Improvidence, drunkenness, indolence, and last, but not least of these terrible evils, trade strikes and lock-outs, each contributes its sad quota of recruits. I would not libel my fellow-countrymen, I would not exaggerate their errors and failings (but truth demands from me this sad statement), such parents are the first to send their little children out to work in brickyards, when they ought to be learning something useful at school (I thank God that such parents are, however, the exception and not the rule), acquiring simple instruction for their minds, so that body and mind might grow together in happy unison, to a manly and womanly maturity. Yet these are in fact (so to speak), the rising generation of the most civilized country of the world. Ignorant, untaught, and unheedful of education, they pass through life, looking on the few 'schollards' among them, with an almost heathen awe. The schoolmaster is to them what a conjurer is to savages. a mysterious superior being. Surely it is due to these poor little slaves that the enlightened genius of our Christian legislature should protect society from any further invasion of ignorance; limit their hours of labour reasonably, and give them the chance of acquiring an elementary schooling suited to their position in life.

"I have known parents in receipt of two, three, and four pounds a week, send their children out to work at clay works, for a few shillings per week, hung in rags, whilst the parents themselves rioted at home in luxuries and drink. On the other hand, I have seen, and I say it with pride, two or three little girls, working hard, anxious for over-time, always cheerful, always at their post, striving like the good angels they were, to win an honest crust for a poor kind sickly mother or grandmother.

"I leave to other pens the drawing out of the pictures here presented, to their ultimate and unavoidable breadth, on the wider growth of these evils in the coming years, when these children become the working men and women of the district.

"But there are other phases of evil connected with work in brickyards and clay works, generally, which I must not overlook, especially the demoralizing results ever accruing from the mixed employment of the sexes. A flippancy and familiarity of manners with boys and men, grows daily on the young girls. Then, the want of respect and delicacy towards females, exhibits itself in every act, word, or look; for the lads grow so precocious, and the girls so coarse in their language and manners from close companionship at work, that in most cases, the modesty of female life gradually becomes a byeword instead of a reality, and they sing unblushingly before all, whilst at work, the lewdest and most disgusting songs, till oftentimes stopped short by the entrance of the master or foreman. The over-time work is still more objectionable, because boys and girls, men and women, are not then so much under the watchful eye of the master, nor looked upon by the eye of day. All these things, the immorality, levity, coarse phrases, awful oaths, lewd gestures, and conduct of the adults and youths, exercise a terrible influence for evil on the young children. Hence, a generation full of evil phrases, manners, and thoughts, is daily growing up in our midst, without the knowledge of better things. It is quite common for girls employed in brickyards to have illegitimate children. Of the thousands whom I have met with, or known as working, I should say that one in every four, who had arrived at the age of twenty, had had an illegitimate child. Several have had three or four, and it is a deplorable fact that, as a rule, brick manufacturers do not trouble themselves to inquire into the moral character of either women or children, when they employ them. I have found myself often looked upon as an oddity, when I have asked 'Is she of good character?' and been subjected to very sharp criticism when I have discharged a single woman, because she was palpably enceinte."

Such are the sentiments of a master brickmaker, who, with a few others of his colleagues, is anxious for the introduction of any measure which would limit the hours of labour in brickyards, and afford to those employed in them the means of education. My own recent inspection of a great many such places convinces me of the obligation there lies upon all thinking persons to look the evils which are growing up from such congregational labour, fairly in the face, and to ask, whether, since such labour can be carried on perfectly, freely, and quite as profitably, both to the employers and the employed, with a reasonable limit to it, with the means of education afforded to the workers, and with a discipline which, in time, would subordinate all these sad propensities to order and regularity, it is wise to prolong the time before making the attempt, till these propensities have become permanently established, and until the state of society may demand sterner remedies to overcome them? I have visited, or have had visited, many brickyards in the United Kingdom within the last five months, and the objections to legal restrictions have been so few by the employers, and in many cases have been so earnestly desired by the workers, that I am satisfied, with slight modifications, the Factory Extension Act could be applied as readily to them as to any other kind of works whatsoever.

You will permit me, I am sure, to express my grateful acknowledgments to all the Potters, both masters and workers, with whom I have come in contact during my personal introduction of the law to them. Nothing could have been more courteous nor more gratifying than the reception I have met with on every hand. Both sides have, I am sure, overlooked many faults of mine, and have foregone many temptations to rebel against a power which at first sight must have appeared very arbitrary and authoritative, compared with the habits and usages of unrestricted labour, from the kindliest spirit towards its administrator, and from a feeling, that the duty was one which opportunity had imposed upon me, and which it was needful I should perform. Shrewd, clever, ready, and thoroughly warmhearted, it is impossible for the potters, as a body, both masters and men, to be otherwise than obedient to the law which has been formed for their benefit. And I look forward to the time with the deepest interest, if happily I may be permitted to see it, when, in the leisure which is now given to them by the restrictions imposed upon labour, education will have effected all those moral and social changes amongst the workers which it is certain to effect when diligently pursued; and when, by a wise thrift and economy of their means, more heads of families than those which we now see, may have become units in the political element of the country, by exchanging practices and vices of barbaric times for the enlightenment and intelligence of the age in which they live.

Fustian Cutters.

On the 19th of August I visited Warrington, to inspect some of the fustian cutting shops there, and to introduce the law to the workers, in fact. They form a considerable body as a trade, mostly consisting of women and girls, of from nine years old and upwards, and are located in and about Warrington in Lancashire, Lymm in Cheshire, Cadishead, Irlam, and Hollings Green, with here and there a few, in the more southerly parts of Cheshire.

The total number of such works in my district is 173, and the number of persons employed about 420 males and 1,060 females, of which latter 200 are children.

A more singular trade, as a trade, whether with respect to the neglected state of the workers both in shop accommodation, habits, and intelligence, I have seldom witnessed.

The fustian cutter is a person who not only makes the cotton fustian with which we are so familiar by name, but velvets also, both of cotton and silk. The operation consists in raising a pile or nap upon cotton or silk cloth, by dividing with an exceedingly finely-pointed and sharp instrument the fibres of the thread of which it is composed, and is one which requires so much aptness and delicacy of touch in the performance, that though many thousands of pounds have been wasted upon experiments, as yet it has not been possible to supersede the present mode of cutting, by machinery.

A piece of cotton cloth, which is very solid and thick, varying in length from 50 yards to 150, the threads of which contain a large amount of twist, and which has been woven hard and stiffened, is brought by the master cutter from Manchester or elsewhere, in exchange probably for one finished and returned. This, is then placed on a board about three yards in length and a yard in width, and is opened out the whole length of the board and then "limed," *i.e.*, it is brushed over with a sweeping brush, dipped in lime in thin solution, and damped all over, in order to "harden the fibres, and make it cut easier;" and it is also soaped at one end to assist the exit of the knife without marking the piece. The cutter then takes in her hand an iron rod, of about two feet in length, having a handle at one end like that which is placed on the tool of a line engraver, for the purpose of steadying the knife during the cut, and at the other end, one of the most delicately tempered blades in the world, which is sharpened on one side for about two inches, by being held on a grindstone turned in water, lest the temper of the steel should be affected by the friction. This knife is then passed through a hollow guard, having a slit in its upper side, through which the blade of the knife just appears when it is pressed home, the guard also having a point, as fine as an ordinary needle, and is then ready for use. The cutter then, taking her stand by the side of the bench or table, introduces the delicate point of the guard under the fibres of the cloth at the end of the board nearest to her right hand, pushes up the guard till the knife reaches the fibres, and then delicately but quickly runs it through the whole three yards of cloth, severing the fibres instantly. This process is repeated on every row of fibres, which amount to about 900, across the cloth, giving therefore 900 cuts to every length, as it is called. With every length the knife requires regrinding, an operation which is not always performed by the cutter, but by the head of the shop, or by a person appointed for that purpose. It is this peculiar delicacy of touch, which shows the cutter when she is cutting wrongly; when she has either missed a thread or is taking two; an accident which would spoil her work, and occasion a severe deduction from her wages.

A master or a mistress cutter may have a shop from home, or he may have it in his own house. He may employ a number of girls or women, or only the members of his own family; he may be in good circumstances, and so command an extensive trade, or he may be a pauper half the year, receiving parish pay and breaking stones at the parish cost, and a fustian cutter the other half. Of this example, I saw several instances. He may be a master, to all intents and purposes possessing fairly the respect and obedience of his workpeople, or he may be one who fuddles his brain at the public house half the week, utterly reckless how his work goes on, on an equality with his hands, and entirely at their mercy whether they will work or not. There are all grades of cutters, and therefore all grades of workers, and altogether, they are, perhaps, as ignorant a class of operatives as can be found in any district in the kingdom. In these shops, as they are called, there may be two or even fifty frames, one person working at each; or the shops may be in flats, one above another. They vary very much in height, in dirt, in the number of broken squares in the windows, in tumble-down ceilings, in dangerous staircases and floors, in an absence of whitewash and paint, and in outside abominations. In some, though in a very few, the visitor passes up a staircase through the living rooms; along the corner of one of the sleeping rooms, redolent of the aggregate breathings of five or six persons, whence a generation has just risen from the stenches of their pestilential mode of life, of curtainless beds, and without any apparent separation of the sexes, into another room the whole length of the house, where there are three or four cutting boards, at which the children of the family or the hired cutters, work from day to day.

The hours of work on a Monday are equally various. For even the most careful employers, very few of the hands work on a Monday. With the fustian cutter, as with the potter, Monday is the patron saint, and is most religiously worshipped, and not only so, but the incense which he leaves behind him is equally worshipped, till nothing remains. Tuesday indeed, does not always see the cutters at work, or if so, only for half the day; and it is often Wednesday before the business of the week really begins. Even then, it is not continued all the day, for "they must have a stroll in the "market-place to see what is going on." Thus Thursday and Friday become what are called "double days," in which all the time previously lost is attempted to be regained by working night and day. They come early, some of them as early as early as 5 o'clock, and work till 8, 9, and 10 o'clock at night, and now and then till 2 o'clock in the morning, and on Saturday, till 6 or 7 p.m., or later, until the aggregate week's work is accomplished. I questioned several of the young women as to the reason for this excessive idleness and industry, and was answered, "because it was the custom of the place," a custom which they declared themselves unable to break through, however unwilling they might be to continue it; but it was a custom that both masters and workers hoped to see an end put to, by the new law. "If there was one "thing more than another that they hoped for from the new "law, it was, that work might in future be regular from day "to day; and that on Saturday, it might be discontinued "after dinner."

One may fancy, but can scarcely realize the wretchedness which this condition of labour produces; the social irregularities, the grossly animal propensities which it incites and perpetuates. Without moral training, and apparently without religious feeling, these females are brought up from their earliest years in intimacy with associations which are most degrading; so much so, that one wonders to observe and compare the amenities of middle life, and the features which characterize the fustian cutter's existence; but how much more is that wonder excited, when we draw the comparison between them and the highest forms of civilization.

The Factory Act has been in operation for some time at Warrington, and for the size of the place, a good many persons are employed therein. It thus often happens, that where a parent has two daughters, one employed at the factory, and the other at fustian cutting, the advantages of the Factory Act, and the disadvantages of labour unregulated by law, are prominently exhibited. The factory worker rises at half-past 5, has her meals at regular intervals, and ends her ordinary day's work at 6 p.m., and on Saturdays at 2. The fustian cutter works when she likes, rises when she likes, snatches a meal when she can, goes to bed by 12 p.m., and is, perhaps, the slave of a drunken mother, and has to attend to house work in her mother's absence, when she ought to be earning her own wages. These disjointed meal times in a poor man's house, and irregular hours of work, render the maintenance of a family doubly and trebly expensive, and afford none of that comfort which they might otherwise enjoy.

With respect to wages for this kind of labour, a steady cutter will earn 5*s.* 9*d.* for a hundred yards, *i.e.*, on an average she will cut 12 lengths a day for four days, each piece amounting to 96 yards. The pieces, however, vary, and the receipts also. "They say," said a mistress cutter to me, "we get as much in proportion for long lengths as short "ones, but I know we don't." Adult men and young persons of 16 earn about the same wages, children earn 1*s.* 9*d.*

On being asked, why with such wages, the men did not carry their labour to a different market, they only intimated, "that fustian cutting was the trade in which they were "brought up, and they were neither fitted nor cared for "any other."

I did not notice any cases of distortion from fustian cutting. Any similar irregular labour, with irregular and meagre meals, and especially where such gross habits prevail, would produce some deformities unquestionably. But under restricted hours, I do not see any reason to apprehend evil consequences from it. There is some reluctance on the part of a few cutters to comply with the law. I have had to prosecute two or three, and I have since heard, with the best effect.

PAPER STAINERS.

I have no particular observation to make upon paper staining, for the number of such works in my district are very few. There are some small ones in Ireland, where the children employed are as young as 10, and where the work is irregular. The terms of the Act appear to have fallen short of a kind of paper staining, at which a good many young women are employed, namely paper colouring by means of a brush. These terms declare those works only under the law, "in which persons work for hire in printing "a pattern in colours upon sheets of paper, either by

" blocks applied by hand, or by rollers worked by steam, " water, or other mechanical power;" thus paper staining, when done by a brush only, is exempt.

PERCUSSION CAPS.

The four percussion cap manufactories in my district are in Birmingham, and they, together with the cartridge makers, employ the following numbers of persons:—

Adults.		Young Persons.		Children.	
Males.	Females.	Males.	Females.	Males.	Females.
14	109	0	54	2	17

All the workshops where there might possibly be a danger of explosion, have been removed from the town to a distance of between three and four miles. The process of tinfoiling is still performed in the town warehouses; but although caps explode now and then, it is confined to the particular cap, and is incommunicable to any of the rest. I have visited all the works at Greet and Witton, the places where the dangerous processes are carried on; and it appears to me, that every reasonable precaution is now taken to prevent explosions, at all events of such a nature as that which took place in Graham Street a short while ago, when, I believe, two or three lives were lost. The describing of one may exemplify all. The magazine is a small house of wood of about 14 feet square, containing, as was stated to me, about eight pounds of explosive matter, wrapped up in parcels of not exceeding a pound weight each. This house is not less than 70 yards from the mixing house, and 100 yards from any other building, not connected with the establishment. The priming shop is 20 yards from the mixing house. The size of the mixing house is also about 14 feet square, and it is composed of half inch deal, so as to be as light as possible. Two women only work in this house, one of whom has the management. She earns 1*l.* per week, but has only been working a few weeks. The fulminating mercury is not made on the premises, but is bought of another person, and when it is brought to these works, it contains about 4 per cent. of water, which it retains, and thus is kept from exploding. When it is drier, then it becomes highly dangerous. The tinfoilers work in a separate place altogether. They merely cut tinfoil into small discs to drop into the caps over the powder, and press it in so as to raise up a little centre having the assumed virtue of entering the foramen of the gun nipple, and in consequence of exploding more readily. Where there is no tinfoil used, a varnish made from shellac is dropped into the cap instead, by a very ingenious process, and is called wetting.

The priming process is one evidently requiring great delicacy of management. It has been exactly described by Mr. Commissioner White. A very inadvertent shake might bring about a serious explosion. The children employed in these works have been discharged.

CARTRIDGE MAKING.

The area of the cartridge makers' works, which lie also in the country, at about two miles distant from Birmingham, is considerable; and contains, first, the powder magazine, which is a shed of wood, and charged with a considerable quantity of coarse-grained powder. To this room no other person is admitted but the manager, who is a man, and a girl whose duty it is to fetch the powder therefrom, and to distribute it to the cartridge makers, and to the makers of fog signals, when these two are made on the same premises.

There is, secondly, the store room, in which the cartridges are stored after they are made, preparatory to their removal for distribution. Then there is a case maker's shop, in which five little girls make the cases for cartridges. These form in fact part of the cartridge maker's shop, and where the cases are filled with the powder and bullets by young women, and where they are completed.

In the same premises I have seen too, a shop, also of wood, for the making of fog signals by women; and there is also an Enfield cartridge making house, about 30 yards from the other cartridge house. Lastly there is a priming house. Many of the observations which I have made on the manufacture of percussion caps are applicable to cartridge making. The workers, having a long way to go to their places of employment, and as these were in the country, seemed to think it hard that they might not work after 6 p.m. in the summer months. It is astonishing indeed to find how little such people appreciate leisure for the acquirement of any knowledge for domestic purposes, or for the comfort of the homes they are all, nevertheless, hoping some day to possess.

Lucifer-Match Making.

The lucifer-match makers in my district are as follows:—There are two at Bristol, two at Birmingham, two in Dublin, two in Belfast, and one in Leicester. There are also two vesta manufactures in Birmingham of considerable size and importance.

Of the two lucifer-match manufactories at Bristol, one has been removed to a considerable distance from the town, and when I saw it about a fortnight ago, it was altogether under temporary arrangements, preparatory to suitable buildings being erected. Under these circumstances, it is not necessary that I should make further observations upon it. The other is still carried on in small rooms, behind the dwelling house of the proprietor. The wood which this manufacturer uses, is not, as in the former place, cut on the premises, but bought ready cut in London; but the process of dipping, making up, &c., are all carried on in one shed, or what is tantamount to it. This appears to be objectionable, and I have requested that the heating of the compound for dipping purposes may, in future, be carried on in an adjoining apartment. In none of these places are many persons employed, and those that are, are principally boys. I had no opportunity of ascertaining, in consequence of the temporary absence of some of them, whether any evil effects from phosphoric action had taken place upon the gums or teeth.

Of the two places at Belfast, Mr. Sub-Inspector Darkin, writes:—

"In accordance with your instructions, I have visited the premises of ——— and ———, lucifer-match makers. The former is a manufacturer also of ball blue, and a packer of coffee and Epsom salts for the trade. His premises comprise three floors of about 70 feet long, 18 wide, and 9 high. The top room is about 18 feet high in the centre, owing to the roof sloping from the side walls. The ground floor is principally used for cutting wood, and making up of packages in large cases. On the first floor, empty match boxes, &c., made by women at their own home, are stored. In the top room, lucifers are formed, dipped, boxed, and packed. The ground floor is lighted by two large glazed windows on one side, and on the other are three unglazed windows, with shutters, which are generally closed. The first floor has three unglazed windows (about three feet by two in size) on each side, three of which are often closed by shutters. But there is a door in this room looking into the str eet, which is open during working hours. The top room has also six unglazed windows, 3 feet by 2, which are always open, and two skylights, 4 feet by 2, in addition, and these are always opened when dipping is going on beneath them. The boys work in this place as they are wanted. The latter manufactory is behind the dwelling house of the proprietor, but not connected with it. The principal erection is a brick building, of about 20 feet long, 16 wide, and 9 high, with a loft above the same size, but about 14 feet high in the centre. On the ground floor two men cut wood. The master dips the matches, and a boy takes the matches out of the frames. The door is always open when work is going on, and there are two windows, 3 feet by 2, one of which is unglazed, and consequently always forming a ventilator. In the top loft are two windows and two skylights, each about 2 feet by 3, which latter are always open whenever there is any steam from below, and the door is always open during working hours. Here some boys fill cases with splints, &c., ready for dipping; others fill boxes with matches, and a man prepares wood for boxes. In the yard are two wooden sheds, each about 20 feet long, 8 wide, and 8 high; the one being used for cutting wood, and the other for steaming it. There is also a fire-proof building, 16 feet long, 10 wide, and 10 high, with a stove in it for drying the splints, and two ventilators in the wall. Dr. C. examined the teeth of the 16 in the former manufactory, and pronounced them perfectly sound; but on three of the 13 examined at the latter, he found sponginess of the gums, and the teeth were slightly denuded of enamel.

In the vesta works in Birmingham four men and a considerable number of females are employed, of whom about a third are adults only. There is a considerable difference between the two manufactories in point of size, ventilation, and cleanliness; in the one the rooms, are sheds, well aired, lighted and ventilated. The waxing room is also clean and comfortable, and well lighted. The dipping tub is so far apart from the workers that any fumes arising from it, which are not carried off by the ventilators placed near it, are so diffused as to be innocuous. The drying room is less offensive than might be expected, and the floor is covered with saw-dust, to prevent explosion, and is heated by flues under the floor. I saw no evidence of disease in any of these workers, and heard of none. The works are admirably constructed to prevent as much as possible any aggregation of poison, and any danger of its being absorbed into the system. Visiting the factory at dinner time I observed one girl writing copies and another reading, some proof of the respectable character of the girls working here. They have breakfast before they come, a quarter of an hour for lunch: dinner from one to two, and leave off work at 6 p.m. The principal danger in these works, as it appears to me, arises from the waste matches which may be seen everywhere on the floor, and which are being constantly ignited by the workers treading on them on passing to and fro along the rooms; and this is a danger of fire to the worker's dressers. Care is, however, taken to obviate this as much as possible.

I regret that I am not able to speak in the same terms of commendation of the other vesta works, which I have now twice visited. The shed, which is a new building, apparently hastily erected, consists of two small flats. In the lower one, huddled together in two small rooms, are seven or eight young girls making tin boxes, with the refuse tin in such piles as materially to diminish not only the room for moving about in, but the breathing space of the workers. In another room adjoining, and sitting or standing as closely as they can be packed, are 50 or 60 children, performing the various operations of vesta making; and turning out of this into a long narrow passage, may be found three or four other workers waxing or cutting vestas, with the dipping pot and slab between them; above this lower room, with an access by an outside stair, is a room in which paper boxes are made by a further set of girls belonging to the same establishment. In the yard is a conglomeration of all sorts of waste materials, rendering it difficult of access, the whole place bespeaking a hasty construction and a hasty collection of workers, apparently without much regard to character or condition; without order and without discipline. In these two cases are exemplified what may be done and what may be neglected in such congregated labour, and how the moral tone of society may suffer from it. A female overlooker, married and of mature age, is as essential to the prosperity, the good government, and the moral character of such an establishment as the materials on which the workers are employed. There is no master but would find the greatest benefit and profit to himself in such an arrangement, and it ought to be a condition of labour, exceptionally compulsory.

BLEACHING AND DYEING WORKS ACT EXTENSION ACT.

It is only in the north of Ireland of all my district, so far as I have been able hitherto to discover, that there are warehouses which come under the provisions of this Act. Mr. Sub-Inspector Darkin reports 31 places of business, where the following persons are employed:—

Adult.		Young Persons.		Children.		Total.
M.	F.	M.	F.	M.	F.	M. & F.
422	280	132	65	6	7	912

and who are under the law; but in no case has there been any election to vary the hours from the ordinary hours of work.

He has visited a number of other places which are exempt owing to their being only males above 14 years old employed therein.

The greatest anomaly of this Act arises from the circumstance that there are many places of business in which numbers of females and children are employed in work which falls under one or other of the designations within the Act, whilst others under the same roof do not; so that, whilst the former are dismissed at 6 p.m., the others are liable to be detained ad libitum.

For example, there are many places where the men only are employed in "lapping," &c., while the females on the same premises are engaged making shirts, collars, and cuffs of the cloth, but not in the manufacture of the cloth itself. The Act appears definitely to point out that the females must be employed on something connected with the finishing of cloth or yarn; but winding, sewing, and marking have nothing to do with what is technically understood by finishing. The muslin manufacturers, for example, give out yarn to weavers, who work it up at home, and return it again in the form of muslin. After being examined and marked, the muslin goes to the bleachers to be finished, lapped, and packed under heavy pressure, and it is then sent back to the warehouses. After it reaches the warehouses again, in some instances, a piece of ribbon or gilt paper is placed round each parcel, and the goods are then put into pasteboard boxes or tied up for customers. The question is, is this decoration and boxing the packing meant by the Act? for as it seems to me, a similar process to this takes place in all drapery establishments. "Packing" in all the Factory Acts has never to my knowledge been interpreted otherwise than as the last act upon them before they are sent away. So, in like manner, the shirt and other manufacturers make their articles on the premises, send them elsewhere to be finished, and receive them back as the muslin manufacturers do theirs, to be put into pasteboard boxes. I cannot better illustrate this position than as follows:—

In eight warehouses there are employed—

Firms.	Adults.		Young Persons.		Children.	
	M.	F.	M.	F.	M.	F.
8	82	121	19	32	0	7

all of which persons are exempt.

In other six firms the following persons are employed:—

Firms.	Adults.		Young Persons.		Children.	
	M.	F.	M.	F.	M.	F.
1 - -	69	28	22	7	3	not under the law.
	61	1	13	0	0	under ,,
2 - -	42	12	10	2	0	not under ,,
	40	5	0	0	0	under ,,
3 - -	10	7	8	1	0	not under ,,
	4	7	3	1	0	under ,,
4 - -	9	31	2	2	0	not under ,,
	9	0	2	2	0	under ,,
5 - -	34	7	10	3	0	not under ,,
	15	7	3	3	0	under ,,
6 - -	27	58	10	22	0	not under ,,
	17	4	6	0	0	under ,,

and they are all working, according to the conjunctive brackets in separate establishments, but every two lines, in the same establishments. Those in the upper lines are not within the law, whilst those in the lower lines are so. Thus we have 668 colleagues working, but the minor number, 202, are privileged to leave work at 6 p.m., whilst 466, the major, may work till 8.

But the question is, is it considered by the worker a privilege to leave at 6? Perhaps not. For as they all work by piece work, they who stay the longest, earn the most money in all probability, and so the legal workers become dissatisfied. Moreover, the non-legal worker can rise later, and go to work later, and still work a day, which is denied to the legal worker.

In both these cases, the females and young persons who are exempt, are so, because they are not employed in finishing the cloth itself; but work on garments or fragments of cloth in some of the following processes:—cutting, folding, stitching, embroidering, sorting, washing, stretching, or ironing robes, handerchiefs, dresspieces, d'oyleys, napkins, table cloths, cuffs, collars, or shirts; working sewing machines, washing cloth before it is sent to the bleacher's to be finished, making up samples, patterns, &c. Many linen warehouses are wholly exempt, because none but males over 14 are employed; and some, not exempt at present, will soon be so, because they will not in future take apprentices under 14. There are also many other warehouses in Belfast, which are not under the law, where females are employed, particularly those occupied by sewed muslin manufacturers, and their agents; many of the latter merely giving out work to be done in the surrounding country, and when they receive it back again, it is sent to Glasgow or elsewhere to be finished and sold. Not having been in Ireland myself lately, I am indebted to Mr. Darkin for this information, which he has been at considerable pains to collect. The Act thus appears to operate very unequally upon the workers employed upon different kinds of labour in warehouses, which is in a great measure owing to the want of designations in the first instance; and it will probably be amended whenever the sewing machine workers are brought under similar restrictions, which, I presume, will take place shortly, and would be very desirable.

I venture once more to express a hope that before long the Bleaching and Dyeing Works Act, with all its supernumeraries, the Print Works Act, the Lace Works Act, and Finishing Works Acts, will all be repealed, and that the works which they now regulate will be placed under the Factory Acts Extension Act.

The different sections of these numerous Acts operate so variously, require such different interpretations, and call forth such observations on their particular favouritisms, so to speak, that it would be most useful to place all these regulated workers on the same footing; or if exceptions are really needed, to limit them to one Act instead of eleven. For example, the Bleachworks Act and its addenda profess to limit the labour of workers under them to the hours of the Factory Act. But they do no such thing, since for any cause whatever the hours of work may be extended from 12 to 14 per diem, less meal times.

The open-air Bleach Works Act is entirely inoperative, as compared with the Bleach Works Act, unless persons are working in bleach yards before 6 a.m. and after 8 p.m. The Print Works Act permits children to be employed till 10 o'clock at night, and makes no provision for their meal-times. Of the Finishing Works Act it is sometimes difficult to say what is finishing and what is not. Whilst with respect to the Bleaching and Dyeing Works Act Extension Act, it contains two or three anomalies which I feel confident were never intended to be found there.

First, it does, and does not apply, in the same works; as I have shown in the lapping warehouses of Belfast.

Secondly, by the power which it gives to the owner to elect his hours of work between 6 and 6, 7 and 7, and 8 and 8, it may take away the privilege of working overtime at the very moment that it gives it; and,

Lastly, whilst the 16 & 17 Vict. c. 104. s. 14, entirely prohibits the employment of children, and the Bleach Works Act, upon which the Extension Act is founded, carefully excludes them from all overtime work, this Act, by the reintroduction of their names, in connexion with the elective right of employment till 8 p.m., removes the previous prohibition to work after 7, in violation of every compromise by which the 7 Vict. c. 15., and its addenda, were agreed to.

Moreover, as one occupier may happen to combine on one set of premises and under one roof all or several of these trades, so he requires as many abstracts and as many interpretations of them; and no inspection could prevent him transferring his hands from one set of works to another, in violation of the law, if he were so disposed, and so to work them at his pleasure.

The following gentlemen have been appointed certifying surgeons since my last report:

England.

Audlem, Cheshire, R. B. Bellyse, Esq.
Ashby-de-la-Zouch, Leicestershire, Trevor Morris, Esq., M.D.
Aldridge, Staffordshire, W. H. Cooke, Esq., M.D.
Bovey Tracey, Devon, N. J. Haydon, M.D.
Bideford, Devon, T. L. Pridham, Esq.
Broseley, Shropshire, Rd. Thursfield, Esq.
Bridgewater, Somerset, W. L. Winterbotham, Esq.
Bishops Waltham, Herts, H. Greaves, Esq.
Burslem, Staffordshire, Jos. Walker, Esq.
Bewdley, Worcestershire, Cecil Webster, Esq.
Bracknell, Berks, Thos. Crofts, Esq.
Cambourne, Dorset, A. Vann, Esq.
Crewe, Cheshire, W. E. Vaughan, Esq.
Cirencester, Gloucestershire, Ed. Cripps, Esq. M.D.
Coleford, Gloucestershire, John Hatton, Esq.
Chilcompton, Somerset, R. H. Boodle, Esq.
Cadishead, Lancashire, J. L. Fletcher, Esq., M.D.
Coleford, Gloucestershire, John Hatton, Esq., M.D.
Cheltenham, Gloucestershire, A. Fleischmann, Esq.
Chester, Cheshire, Job Harrison, Esq.
Deddington, Oxfordshire, J. T. Morris, Esq.
Dudley, Staffordshire, Jas. Fisher, Esq.
Emsworth, Herts, W. D. Stephens, Esq.
Ellesmere, Salop, J. W. Moorhouse, Esq.
Farringdon, Herts, F. C. Spackman, Esq., M.D.
Fareham, Hants, W. Barnard, Esq.

Glastonbury, Somerset, H. W. Down, Esq.
Gloucester, H. Peacock, Esq..
Hanley, Staffordshire, W. H. Folker, Esq.
Hungerford, Berks, H. P. Major, Esq.
Horwich, Lancashire, —. Robertson, Esq., M.D.
Kingswood Hill, Bristol, H. Grace, Esq.
Lostwithiel, Cornwall, J. Blewitt, Esq,
Leigh Sinton, Worcestershire, P. F. Knipe, Esq.
Lymm, Cheshire, W. B. Bennett, Esq., M.D.
Longton, Staffordshire, S. P. Goddard, Esq., M.D.
Malpas, Cheshire, R. Cumming, Esq., M.D.
Newbury, Berks, F. E. Ryott, Esq.
Nantwich, Cheshire, J. E. Williamson, Esq.
Northwich, Cheshire, T. C. Dixon, Esq., M.D.
Newent, Gloucester, J. C. Cooke, Esq.
North Curry, Somerset, H. P. Oliver, Esq.
Newport, Salop, J. C. Lindop, Esq.
Newnham, Gloucester, J. S. Collins, Esq.
Prescott, Lancashire, D. Barrow, Esq.
Penkridge, Stafford, W. T. Girdlestone, Esq.
Penzance, Cornwall, F. Boaze, Esq.
Ridgway, Somerset, A. J. Marsh, Esq.
Runcorn, Cheshire, R. H. Mouritz, Esq.
Reading, Berks, O. C. Maurice, Esq.
Stone, Staffordshire, E. Fernie, Esq., M.D.
Stafford, Staffordshire, A. Thomas, Esq.
Stourbridge, Worcestershire, R. L. Bayley, Esq.
Stoke, Staffordshire, John Arlidge, Esq., M.D.
Seacombe, Cheshire, Jos. Kenny, Esq., M.D.
Southampton, Hants, G. Cheeseman, Esq.
Tunstall, Stafford, G. C. Holt, Esq.
Truro, Cornwall, T. M. Quicke, Esq.
Thornbury, Gloucestershire, W. G. Salmon, Esq.
Wem, Salop, J. B. Gwynn, Esq.
Winchester, Hants, C. Wickham, Esq.
Weston-super-Mare, Somerset, C. V. Hitchins, Esq.
Westbury, Wilts, Henry Ormerod, Esq.
Wellington, Salop, R. P. Weston, Esq.

IRELAND.

Aughadowey, Armagh, P. A. Lane, Esq,
Benburb, Mayo, J. H. Moore, Esq.
Blackrock, Dublin, T. F. Pollock, Esq., M.D.
Bellick, Fermanagh, Wm. Irwin, Esq.
Banbridge, John Hawthorne, Esq., M.D.
Cashel, Tipperary, T. W. Webb, Esq., M.D.

Enniscorthy, Wexford, T. G. Cranfield.
Larne, Antrim, C. Ferres, Esq.
Letterbreen, Fermanagh, Ed. Copeland, Esq.
Tarbert, Kerry, W. Hamilton, Esq., M.D.
Youghall, Cork, Henry Garde, Esq. M.D.

I am,
Sir,
Your most obedient Servant,
ROBERT BAKER.

To the Right Hon. the
Secretary of State for the
Home Department.
&c. &c. &c.

APPENDIX No. 1.

RETURN of PROSECUTIONS for OFFENCES against the FACTORIES and BLEACHING WORKS ACTS, &c., in the DISTRICT of ROBERT BAKER, ESQ., Inspector of Factories, during the Six Months ended 31st October, 1864.

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
1864.			*Informations laid by Mr. Darkie.*	£ s. d.	£ s. d.	
May 19	Waring and Duncan flax spinners, Ligoniel, Belfast.	Edward Orme, Esq., R.M., and W. T. B. Lyons, Esq., Belfast Petty Sesions.	Employing five females after 6 o'clock in the evening.	5 0 0	0 12 6	
May 27	John Emerson, flax spinnes, Ballysillan, Belfast	” ”	Employing twelve females and young persons after 2 o'clock on Saturday.	10 0 0	1 7 0	Two cases withdrawn on payment of costs.
June 13	Owen O'Cork, Mill Company, flax spinners Ballyhackmore, near Belfast - -	W. T. B. Lyons and T. M. Higginson, Esqs.; Holywood Petty Sessions.	Employing seven females before 6 o'clock in the morning, in reeling.	5 0 0	0 16 6	Two cases withdrawn on payment of costs.
” 18	John and Joseph Carr, flax spinners, Tulligirven - - -	Rev. J. Bradshaw, Thos. McLeroth, and Alex. McMinn, Esqrs., Newtownards Petty Sessions	Employing fifteen females and young persons after 6 o'clock in the evening.	12 0 0	2 2 0	Three cases not proved,
”	” ”	” ”	Employing a child before noon and after 1 o'clock on the same day.	- -	- -	It being proved that the child was not actually employed, but that he had merely accompanied his mother to the mill, because she had no regular lodging, these two charges were withdrawn.
”	” ”	” ”	Employing the same child without first registering name.	- -	- -	
Aug. 24.	Atkinson and Crawley, power loom weavers, Craigmore, near Newry	J. L. McCance, R.M., and Dennis Maguire, Esqs., Newry Court House.	Employing twelve young persons after 6 o'clock in the evening.	12 0 0	2 2 0	

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
1864.			*Informations laid by Mr. Steen.*	£ s. d.	£ s. d.	
June 1	Thos. and John Crank, cotton spinners, Hillgold, Stockport.	John Eskrigge, Esq., mayor of Stockport, William Williamson, Esq., Ephraim Hollam, Esq., Joseph Orme Esq., Stockport Petty Sessions.	Employing three young persons and females after 6 p.m.	3 0 0	1 11 6	
"	James Parker, cotton spinner, Hillgold, Stockport.	" "	Employing two young persons and females after 6 p.m.	2 0 0	1 1 0	
"	" "	" "	Employing two young persons and females after 6 p.m.	- -	0 12 0	Withdrawn on payment of costs
"	Samuel Bunting, cotton spinners, Hillgold, Stockport.	" "	Employing one young person after 6 p.m.	1 0 0	0 10 6	" "
"	" "	" "	Employing one young person after 6 p.m.	- -	0 6 0	Withdrawn on payment of costs
June 22	William Bibby, mule spinner, at Ephraim Hollams, cotton spinners.	Cephas Howard, Esq., Stockport Petty Sessions.	Allowing a young person to work between the fixed and traversing parts of a self-acting mule while in motion.	- -	0 7 0	Withdrawn on payment of costs.
"	John Vaughan, mule spinner, at same place.	" "	Allowing a young person to work between the fixed and traversing parts of a self-acting mule while in motion.	- -	0 7 0	Withdrawn on payment of costs
Aug. 3	Kershaw, Leese, & Co., cotton spinners and manufacturers, Mersey, Mills, Stockport.	Joseph Orme, Esq., William Williamson, Esq., Stockport Petty Sessions.	Employing five females and young persons after 2 p.m. on Saturday.	- -	- -	Casesproved.

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
			Informations laid by Occupiers against their Servants as follows :	£ s. d.	£ s. d.	
Aug. 3.	William Nicholson, Overlooker, employed at Messrs. Kershaw, Leese, & Co.	Joseph Orme, Esq., William Williamson, Esq., Stockport Petty Sessions.	Summoned by Messrs. Kershaw, Leese, & Co., for the above offence, in three cases, as being the actual offender.	2 0 0	2 8 6	One case withdrawn on payment of costs.
,,	William Axon, overlooker as above.	,, ,,	Summoned by Messrs. Kershaw, Leese, & Co., for the above offence, in one case, as being the actual offender.	1 0 0	0 17 0	,, ,,
,,	Samuel Swan, overlooker as above.	,, ,,	Summoned by Messrs. Kershaw, Leese, & Co., for the above offence, in one case, as being the actual offender,	1 0 0	0 17 0	,, ,,
			Information laid by Mr. Buller.			
June 15,	Thomas Merritt, foreman at Messrs. Sam. Salter & Co's. factory, Trowbridge.	John P. Stancomb, and Thomas Clark, Esqs., Police Station, Trowbridge.	Employing a young person after 6 p.m.	1 0 0	0 10 6	,, ,,
			Informations laid by Mr. May.			
1864. Sept. 19.	Hartley & Baldwin, Barnley.	Thos. Hordern Whitaker, and John Heelis, Esqrs. Barnley.	Employing a young person for more than seven days without obtaining surgical certificate	2 0 0	0 13 6	,, ,,
,,	Wm. Driver - -	,, ,,	Obstructing Sub-Inspector by concealing a young person.	3 0 0	0 13 6	,, ,,
Oct. 6.	John L. Capenhurst, Birstal.	Francis Tothill and Henry Harford, Esqrs.	Employing seven young persons and three children without registering their names and dates of first employment.	6 0 0	1 17 6	Seven informations withdrawn on payment of costs.
,,	,, ,,	Sessions Rooms, Lawford's Gate.	Employing six persons and two children without obtaining surgical certificates.	6 0 0	1 17 6	Five informations withdrawn on payment of costs.
,,	,, ,,	,, ,,	Employing two children without obtaining school certificates for previous week.	4 0 0	1 5 0	,, ,,
,,	,, ,,	,, ,,	Employing three children before noon and after 1 o'clock on the same day.	4 0 0	1 5 0	One information withdrawn on payment of costs.

APPENDIX No. 2.

TABLE No. I.—*Accidents arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.& F.
Causing death - - -	–	1	–	–	–	–	–	1	1
Amputation of right hand or arm	1	–	2	2	–	–	3	2	5
Amputation of left hand or arm	1	–	1	1	–	–	2	1	3
Amputation of part of right hand	3	6	4	8	–	2	7	16	23
Amputation of part of left hand	–	3	6	11	2	1	8	15	23
Fracture of limbs and bones of trunk - - - -	9	2	13	2	–	1	22	5	27
Fracture of hand or foot - -	3	2	3	7	–	–	6	9	15
Injuries to head and face -	4	4	1	5	3	–	8	9	17
Lacerations, contusions, and other injuries not enumerated above - - -	56	63	88	73	10	4	154	140	294
Total - -	77	81	118	109	15	8	210	198	408

TABLE No. II.—*Accidents not arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.& F.
Causing death - - -	4	1	–	–	–	–	4	1	5
Amputation of part of right hand	1	–	–	–	–	–	1	–	1
Fracture of limbs and bones of trunk - - - -	3	2	3	–	–	–	6	2	8
Injuries to head and face -	1	–	–	–	–	–	1	–	1
Lacerations, contusions, and other injuries not enumerated above - - -	17	5	1	3	–	–	18	8	26
Total - -	26	8	4	3	–	–	30	11	41

REPORTS

OF THE

INSPECTORS OF FACTORIES

TO

HER MAJESTY'S PRINCIPAL SECRETARY OF STATE
FOR THE HOME DEPARTMENT,

FOR THE

HALF YEAR ENDING 30TH APRIL 1865.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.

1865.

12812.

REPORTS

TO THE RIGHT HONOURABLE SIR GEORGE GREY, BART.

Her Majesty's Principal Secretary of State for the Home Department.

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Report by Alexander Redgrave, Esq.	ditto	ditto	6
Report by Robert Baker, Esq.	ditto	ditto	18

HALF-YEARLY JOINT REPORT OF THE INSPECTORS OF FACTORIES.

Factory Inspectors' Office,
10, *Whitehall, June* 1865.

SIR,

We have met and conferred together respecting our proceedings in the administration of the various Acts of Parliament now under our superintendence, and a reference o our separate reports will show you that, in our belief, he enactments these Acts contain are, upon the whole, airly obeyed.

We have the honour to be,
Sir,
Your obedient Servants,
ALEXR REDGRAVE.
ROBERT BAKER.

The Right Hon.
The Secretary of State
or the Home Department,
&c. &c. &c.

APPENDIX No. 1.

GENERAL ABSTRACT, showing the Total Number of Accidents reported to the Inspectors of Factories during the Six Months ended the 30th April 1865.

TABLE No. I.—*Accidents arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.&F.
Causing death - - -	10	2	5	2	3	–	18	4	22
Amputation of right hand or arm	12	5	10	2	–	–	22	7	29
Amputation of left hand or arm	5	–	4	–	2	–	11	–	11
Amputation of part of right hand	17	7	15	24	4	1	36	32	68
Amputation of part of left hand	11	6	12	23	–	1	23	30	53
Amputation of any part of leg or foot - - - -	3	–	1	–	–	–	4	–	4
Fracture of limbs and bones of trunk - - - -	29	13	26	9	6	1	61	23	84
Fracture of hand or foot -	31	37	30	41	9	7	70	85	155
Injuries to head and face -	16	34	18	21	12	4	46	59	105
Lacerations, contusions, and other injuries not enumerated above - - - -	253	233	152	163	60	34	565	530	1,095
Total -	387	337	373	385	96	48	856	770	1,626

TABLE No. II.—*Accidents not arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.&F.
Causing death - - -	9	–	3	–	–	–	12	–	12
Amputation of right hand or arm	–	–	1	–	–	–	1	–	1
Fracture of limbs and bones of trunk - - - -	12	5	12	4	1	1	25	10	35
Fracture of hand or foot -	1	–	–	–	1	–	2	–	2
Injuries to head and face -	12	4	5	4	3	–	20	8	28
Lacerations, contusions, and other injuries not enumerated above - - - -	46	16	21	5	5	1	72	22	94
Total -	80	25	42	13	10	2	132	40	172

APPENDIX NO. 2.

SUMMARY of the Total Number of Informations and Convictions, and the Amount of Penalties and Costs, in the Districts of the Inspectors of Factories, during the Six Months ended the 30th of April 1865.

DESCRIPTION OF OFFENCE.	Number of Informations.	Result.			Penalties imposed.							
		Convictions.	Withdrawn on Payment of Costs.	Dismissed.	5*s.*	20*s.*	30*s.*	40*s.*	50*s.*	£3.	£5.	£10.
Employing children and young persons without registering their names and date of first employment - - - -	31	7	24	—	—	3	—	4	—	—	—	—
Employing children and young persons without surgical certificates -	44	18	22	4	—	11	—	6	1	—	—	—
Employing children before noon and after one o'clock p.m. of the same day -	14	3	11	—	—	3	—	—	—	—	—	—
Employing children without school vouchers -	13	12	1	—	—	2	—	—	—	10	—	—
Employing children, young persons, and females at night - - - -	14	14	—	—	—	—	—	14	—	—	—	—
Employing children, young persons, and women after six o'clock p.m. - -	12	12	—	—	—	—	11	1	—	—	—	—
Employing children, young persons, and women after seven o'clock p.m. - -	16	9	6	1	—	5	4	—	—	—	—	—
Employing young persons and women after two o'clock on Saturday -	18	14	4	—	—	14	—	—	—	—	—	—
Employing young persons and women during meal hours - - - -	10	10	—	—	—	10	—	—	—	—	—	—
Parents employing or conniving at the illegal employment of their children	5	5	—	—	4	1	—	—	—	—	—	—
Parents neglecting to cause their children to attend school - - - -	3	2	1	—	2	—	—	—	—	—	—	—
Neglecting to give notice of occupation - - -	1	—	1	—	—	—	—	—	—	—	—	—
Neglecting to give notice of accident to the certifying surgeon - - -	1	1	—	—	—	—	—	—	—	—	1	—
Not lime washing, as required by law - -	1	1	—	—	—	—	—	—	—	1	—	—
Wilful obstruction of the sub-inspector in the execution of his office -	1	1	—	—	—	—	—	—	—	—	1	—
Total -	184	109	70	5	6	49	15	25	1	11	2	—

The Total amount of Fines inflicted, £168 10*s.* 0*d.*
The Total amount of Costs, £65 14*s.* 0*d.*

REPORT of ALEXANDER REDGRAVE, Esq., Inspector of Factories, for the Half-year ended the 30th April 1865.

Factory Inspector's Office, Whitehall,
30th May 1865.

SIR,

I HAVE the honour to inform you, that, since the 31st of October last, I have visited works under inspection in the following places: Glasgow and its neighbourhood; Dundee, Lochee, Dunfermline, Edinburgh, Portobello; Newcastle-upon-Tyne, Gateshead, North and South Shields, Stockton, Middlesborough; Leeds, Wortley, Farnley, Castleford; Rotherham, Swinton, Masborough Mexborough; Chesterfield; Stamford; Huddersfield, Golcar, Longwood; Halifax, Stainland, Sowerbybridge, Soyland, Hebdenbridge; Todmorden; Oldham, Shaw, Royton.

In the list of prosecutions annexed to my last half year's Report, it was stated, that the case against Messrs. Harney of Sheffield for having employed females after 6 p.m. had been dismissed by the Magistrates of that borough, on the ground that the manufacture of crinoline skirts by the aid of steam power did not bring Messrs. Harney's premises within the meaning of the Factory Acts.

The crinoline skirt manufactures had been under inspection since the introduction into use of that article of dress, and although objections were raised by those in Sheffield, to their premises being considered to be under the Factory Acts, yet after having received full explanations from the Sub-Inspectors and myself, they apparently accepted the construction of the law which we gave to them. Complaints, however, were made that Messrs. Harney were employing females after legal hours, and upon Mr. Whymper visiting their premises on the evening of the 26th of August last, he found a large number of females then employed in two rooms.

The Magistrates having dismissed the information on the ground that Messrs. Harney's premises had not been proved to be a factory within the meaning of the several Factory Acts, granted a case upon the application of Mr. Whymper, and the case was heard and disposed of in the Court of Common Pleas on the 25th January last by the Court pronouncing the opinion of the Sheffield justices to be wrong, and remitting the case to them.

This decision of the Court of Common Pleas is very important, because it decides much more than that the making of crinoline skirts is carried on by the Messrs. Harney is an operation within the meaning of the Factory Acts.

It appears from the judgment of the court that the manufacture into a fabric of any of the materials named in the Factory Acts, viz., cotton, wool, hair, silk, flax, hemp, jute, or tow, either in a raw state, or after some previous process of manufacture, is clearly within the definition of the Acts. It has been contended that cotton after having been spun into yarn is completed as a manufacture, and that any subsequent process is not contemplated by the Acts. The case of Haydon v. Taylor, 33 L. J., 30 M. C., 9 L. T. Rep. N. S. 382, showed that to be an erroneous opinion where the cotton was spun into yarn at one mill, and then underwent a subsequent process *in another mill of the same firm;* but that decision, having been given upon the facts presented to the court, did not reach the case of the Messrs. Harney in which the cotton was spun into yarn by one firm, and subsequently manufactured into a fabric by another firm. The case therefore of Whymper v. Harney is of considerable importance, and it will be of great assistance in administering the law in various trades, where doubts have existed in the minds of the proprietors, whether the processes did come within the meaning of the Factory Acts.

I subjoin an account of the case as reprinted in the Law Times of the 10th February last:—

"WHYMPER (appellant) *v.* HARNEY (respondent).

"*Factory Acts*, 3 & 4 *Will.* 4. *c.* 103. *s.* 1., 7 & 8 *Vict. c.* 15. *s.* 73.—*Manufacture of Cotton—Crinoline.*

"*A building in which steam power is used, and the manufacture of crinoline steel and crinoline skirts is carried on, the process being that steel plates are cut into strips and covered with cotton, the cotton being either wound round the steel or plaited so as to make a case for the steel, and the steel strips when covered being sewn up in the skirts for sale, is a cotton factory within the meaning of the Factory Acts.*

"Case stated by justices under 20 & 21 Vict. c. 43.

"On the 14th October 1864, John Jones Harney (herein-after called the respondent), appeared in petty sessions before us to answer to a summons issued on the complaint of Frederick Hayes Whymper, sub-inspector of Factories (herein-after called the appellant), charging that he, the respondent, had offended against the Act made in the session of Parliament holden in the 13th and 14th years of Her present Majesty's reign, intituled "An Act to amend the Acts relating to labour in factories," forasmuch as the respondent on the 26th August last past, at the parish and borough of Sheffield, did unlawfully employ a female above the age of 18 years, named Charlotte Roxburgh, in the factory of him, the respondent, after six of the clock of the evening of the said day, to wit, at 30 minutes past the same hour (and not to recover lost time as provided by the said Act). The respondent is the occupier of premises in Granville Street, in Sheffield, in which he carries on the trade of a manufacturer of crinoline steel, crinoline skirts, &c. There is a steam-engine on the premises, the power of which is employed to move and work machinery in three rooms used in cutting steel into strips, and working and preparing such strips as herein-after described, and also in wrapping or covering the strips of steel with cotton thread as herein-after described. There are four other rooms in the premises in which by hand sewing-machines are used, steel strips inserted into skirts and the skirts finished for market.

"The course of manufacturing crinoline steel is, that the respondent purchases of the steel manufacturers sheets of steel rolled very thin about three inches in width and about fifty feet in length, which sheets are cut by circular shears into strips of from one-inch to three-sixteenths of an inch in width ; these strips are then riveted together by the ends in lengths of 1,000 yards or thereabouts, and are reeled or wound into coils of about 80 lbs. each. The coils are then unwound, and as the strip of steel passes along, it is exposed to the influence of heat, then to that of oil, or passed over or between chilled dies or plates of cold steel. By this operation the steel strips are hardened, and, being again heated, become properly tempered ; they are then ground or polished and blued in a finished state, and are then again reeled or measured out into coils, of 36, 72, and 144 yards each. In this process women are employed. Some portions of such coils are sold or used up into skirts, without undergoing any other process than has been above described ; but other portions are previously wrapped or covered with cotton thread. This cotton thread is invariably purchased by the respondent, from spinners or their agents, in hanks or bundles, which, on the respondent's premises, undergo no further manufacturing process, but by means of steam power are next wound or reeled up on bobbins of various sizes for more convenient application around or about the strips of steel. One process of such application is effected by a machine called a wrapping machine, which by steam power turns the cotton thread into single file round and round the strips of steel, as appears by the sample now produced marked "A." The other process or application of the cotton thread is effected by a machine called a plaiting machine, which by steam powers effects a covering for the steel by the interlacing or plaiting of 16 threads together around and over every part of the strips, as appears from the sample now produced marked "B." In the process of covering the steel with cotton, as above described, by steam power, women are employed. The whole of the rooms and premises are within one boundary or curtilage.

"On the hearing of the complaint before the justices, the appellant proved that he was sub-inspector of factories for the district in which Sheffield is included. That on the 26th August last, in consequence of some information, he went to the works of the respondent in Granville Street between half past six and a quarter to seven o'clock in the evening, and on going upstairs he found in a first room a number of girls and young women standing in an opening on one side of the room, which he could best describe as resembling the bar of an inn, and that the persons were in the act of delivering their work to a woman inside an apartment where the skirts are received after they are made. Charlotte Roxburgh, named in the information, was at the bar delivering or passing over skirts. Then he (the appellant) proceeded into a further room, and there seated on benches by the side of long tables, he found a second and larger number of females occupied in making up crinoline skirts. Two male assistants of the respondent were present, and he (the appellant) pointed out to them what he conceived to be an illegality of the proceedings in their being employed after six o'clock; that he (the appellant) had, on previous occasions, been in other parts of the respondent's premises; that there is machinery propelled by steam power, and the process in such other parts carried on is, the covering of steel with cotton by machinery, which twists or winds the cotton round the steel; that the piece of steel covered with cotton, produced marked "A." is similar to that made on respondent's premises; that the rooms in which the young women were working are within the outer gate and the boundary walls of the premises where the steam power is applied; that some of the young women were employed in inserting or securing the covered steel into skirts, for garments called crinoline skirts.

"On cross-examination by the respondent's attorney, the appellant stated that he saw no machinery in the two rooms, and the young women could have done the work they were doing just as well at their own homes. That the respondent is what is termed a crinoline manufacturer. The skirts referred to in the above evidence are composed of gores cut from pieces of calico nets or plain or coloured cloths of various kinds, and sewed together into the folds or hems of which the strips of steel are run or inserted, and so the articles are formed into the female garment or appendage called a crinoline skirt.

"On the above statement of facts and evidence, we, the undersigned justices, were of opinion that the respondent's premises at Sheffield were not and could not be called and considered, in the ordinary use of words, a cotton-mill, and did not become a cotton-mill or factory within the intent of the 3 & 4 Will. 4, c. 103, by reason of the application of the steam power to machinery used therein for manufacturing steel and cotton thread and other materials into crinoline by the means and in manner herein-before described. We were also of opinion that on such premises and for such a purpose, the process of wrapping or covering by machinery crinoline steel with cotton thread was not, within the meaning of the 7 & 8 Vict. c. 15, s. 73, a process incident in any way to the manufacture of cotton or to any fabric made thereof or mixed therewith, but was incident to the manufacture of crinoline steel in like manner as the covering or wrapping of driving or riding whips, if effected by machinery of the same character with silk twist, or strong linen thread and other materials is not a process incident to the manufacture of silk or linen, or to any fabric made thereof, but would be a process incident to the making of whips. We therefore dismissed the summons. If the court should be of opinion that our determination is correct the same will be confirmed; if otherwise, the court will make such order as the court may direct.

"*Hannen* (the *Solicitor-General* with him) for the appellant.—The premises of the respondent are used for the manufacture of cotton within the meaning of the Factory Acts. The 3 & 4 Will. 4. c. 103, s. 1, enacts:

" 'That no person under 18 years of age shall be allowed to work in the night (that is to say) between the hours of half past eight o'clock in the evening and half past five o'clock in the morning, except as herein-after provided, in or about any cotton, woollen, worsted, hemp, flax, tow, linen, or silk mill or factory wherein steam or water or any other mechanical power is or shall be used to propel or work the machinery in such mill or factory, either in scutching, carding, roving, spinning, piecing, twisting, winding, drawing, doubling, netting, making thread, dressing, or weaving of cotton, wool, worsted, hemp, flax, tow, or silk, either separately or mixed, in any such mill or factory.

" By 7 & 8 Vict. c. 15, s. 73,

" 'The word "factory," notwithstanding any provision or exemption in the Factory Act, shall be taken to mean all buildings and premises situated within any part of the United Kingdom of Great Britain and Ireland, wherein or within the close of curtilage of which steam, water, or any other mechanical power shall be used to move or work any machinery employed in preparing, manufacturing, or finishing, or in any process incident to the manufacture of cotton, wool, hair, silk, flax, hemp, jute, or tow, either separately or mixed together, or mixed with any other material or any fabric made thereof; and any room situated within the outward gate or boundary of any factory wherein children or young persons are employed in any process incident to the manufacture carried on in the factory, shall be taken to be a part of the factory, although it may not contain any machinery; and any part of such factory may be taken to be a factory within the meaning of this Act.

["The subsequent Act of 13 & 14 Vict. c. 54, under which the information is laid, regulates the age at which women may be employed, but does not affect the question to be decided here.] It does not follow, that because the woman mentioned in the information was not proved to be engaged in working at cotton, she does not come within the Act, because the Act is for the regulation of cotton factories and applies to any person within the curtilage. The result of the two sections is, that any building will be a cotton factory if steam power is used in it in preparing cotton, or in any process incident thereto. Steam power here is used in twisting and winding the cotton for the purpose of being used in the manufacture carried on in the building. It makes no difference that steel is also employed. In *Haydon* v. *Taylor*, 33 L. J. 30 M. C. 9 L. T. Rep. N. S. 382, a detached set of premises in which all that was done was to wind cotton from one reel on to another, was held to be a cotton factory. The manufactory could protect himself if he pleases under section 73, by having the cotton process all carried on in one room. An illustration may be drawn from—

Taylor v. *Hickes*, 12 C. B. N. S., 152; 31 L. J. 242, M. C.; 6 L. T. Rep. N. S. 784.

"*Quain* for the respondent.—The statutes are penal, and to be construed strictly. They were intended to apply to cotton-mills: (see 3 and 4 Will. 4. c. 103. s. 2. and the penalty clause in 7 & 8 Vict. c. 15. s. 56.) A building is only a factory if it is used for the preparation of cotton, and if cotton goes through numerous stages in it. "Process incident to it" means incident to the manufacturing of cotton. The words "mixed with other material" are only inserted to prevent persons from evading the Act by mixing it with other material, as at Bradford, where it is mixed with wool and made into what are called "mixed fabrics." [Keating, J.—But is not plaiting cotton a process within the statute? Suppose there was a factory exclusively devoted to plaiting the cotton, which might be sold to the persons who placed it round the steel, would it not be a cotton factory? Does it make any difference that the plaiting and the winding round the steel are done on the same premises?] It depends on how the plaiting is done. *Cole* v. *Dickenson*, 10 L. T. Rep. N. S. 616, is an authority in favour of the respondent.

"*Hannen* in reply.—The Act of 3 & 4 Will. 4. actually contains the words "winding," and the process in *Haydon* v. *Taylor* was held to be a winding within the meaning of that Act, as a process within that of 7 & 8 Vict. c. 15.

"ERLE, C. J.—The question in this case is, whether the premises of the respondent were shown, on the facts stated, to be a factory within the meaning of the Factory Acts. [His Lordship read the words of the section set out above.] I am of opinion that they were shown to be a factory. Cotton is employed on them in two ways: first, for winding round steel; secondly, for making a fabric as a case for the steel, crinoline skirts being the product manufactured for sale. The fabric is composed of a plait of 16 threads, and that is a fabric made by manufacturing cotton within the words of the statute. The case put by my brother Keating in the course of the argument is decisive of the judgment to be given here. If cotton were made up in a separate building into a material which was to be used for covering crinoline steels, no one would doubt that the building would be one used for manufacturing a cotton fabric. Cotton was used on these premises, and steam power was used; and I think that the decision of the magistrates was wrong.

"WILLIAM, J. — I am of the same opinion. Cotton thread is here woven by machinery into a fabric, and the case comes, I think, within the very words of the statute.

"WILLES, J.—I am of the same opinion. A cotton fabric is certainly manufactured on the premises, and it is not the less so because it is intended to be used in combination with steel for the purpose of producing the article to be sold. I am inclined to doubt if this is a manufacture of a combination of cotton and steel. It is a manufacture of a cotton fabric which is afterwards to be combined with steel.

KEATING, J. concurred.

"*Judgment for the appellant, the case to be remitted to the magistrates.*

The preparation of special rules under the Factory Acts Extension Act, 1864, s. 4, for the enforcement of Regulations which may be made by the occupiers of works under that Act for the maintenance of cleanliness and ventilation has not advanced in my district. At the date of my last Report the subject of a general form of special rules for earthenware works was under your consideration, and I felt it to be premature for me to urge the adoption of special rules upon the earthenware manufactures of my district, until I could give them a general notion of the kind of special rules which would meet with your approval. Having received your instructions upon the subject with a copy of the alterations which you deemed the draft rules submitted to you, to require to bring them within the meaning and force of the Act, I forwarded on the 26th April a copy of these amended rules to the earthenware manufacturers of my district. In making this communication, I suggested that they should consider the matter with their workpeople, and especially that the workpeople should be made to understand the liability would attach to them. I also explained that the rules forwarded were to be considered as draft rules, and as the same arrangements might not be equally applicable to all establishments, any necessary modifications would be fully considered.

Sufficient time has not yet elapsed for the consideration of this subject by the manufacturers, but I am inclined to think that the rules will be carried out to a considerable extent in spirit, without any formal adoption or approval. I have recently had an acknowledgment of my circular from one of the earthenware manufacturers of my district who is most anxious to carry out the new law in every respect, in which he expresses his approval of the Rules and says "I was never able to keep my Factory clean until now." I trust to be able to inform you of a considerable advance in respect to cleanliness and ventilation in my next report.

The following is a copy of the Rules, which I have circulated for the consideration of the earthenware manufacturers:

"Under the authority of the Act of Parliament of the 27 & 28 Vict. c. 48. for the extension of the Factory Acts, the following Special Rules have been made for the due Cleanliness and Ventilation of the ——— ———.

"1. No workmen shall in any way interfere with the measures taken for the ventilation of the various workrooms without the sanction of the manager of the works.

"2. In pursuance of arrangements made by us with our workmen for the sweeping and cleansing of the workshops, which arrangements are as follows, viz.:—

["Here insert a scheme, showing what workmen are responsible each day in every week for the due performance of the sweeping and cleansing. The scheme might be in the following or in other similar form:

"The names of all workmen employed in each room shall be placed in alphabetical order upon a board, and the sweeping, sprinkling, &c., shall be performed by each man in turn. The manager shall daily cause to be noted on the board, at least one hour before the usual time of leaving off work, the name or names of the man or men whose duty it will be to perform the sweeping, sprinkling, &c, on the following day.]

"A. The various rooms in which the flat-pressers, hollow-ware-pressers, throwers, turners, and moulders are employed, shall be sprinkled and swept out every day; and all the other workrooms, except those for storage only, shall be swept out and cleansed at least once a-week. Each bench shall be washed down and cleansed once a-week at least.

"B. In the saggar-houses, the floors shall be properly swept and sprinkled after every setting-in of an oven.

"C. The steps and stairs up to and in the various workshops shall be scraped clean and swept at least once-a-week.

"3. Any workman who, under the above arrangements, is responsible for such sweeping and cleansing, and who neglects to perform the same, and any workman wilfully interfering with the ventilation, sweeping, or cleansing before specified, shall, upon conviction, be liable to a penalty not exceeding the sum of one pound."

I have, &c.
Alex. Redgrave.

To the Right Hon.
Sir George Grey, Bart., M.P.,
&c. &c. &c.

APPENDIX No. 1.

RETURN of PROSECUTIONS for OFFENCES against the FACTORIES REGULATION ACTS, &c., in the DISTRICT of ALEXANDER REDGRAVE, Esq., Inspector of Factories, during the Six Months ended 30th April 1865.

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
			Informations laid by Mr. Coles.	£ s. d.	£ s. d.	
1864. Dec. 15	R. H. Alcock, Hudcar Mill, Bury.	O. O. Walker, and R. Beale, Esqrs., Bury.	Employing five women and one child after 6 p.m.	9 0 0	4 5 0	
			Informations laid by Mr. Campbell.			
1865. Apr. 20	Henry Monteith & Co., Barrowfield Print Works, Glasgow.	William Campbell, William McLean, Justice of Peace Court, Glasgow.	Employing ten females during the night.	20 0 0	0 4 1	
			Informations laid by Mr. Rickards.			
1864. Dec. 2	Messrs. R. and T. Grimston, Mickley.	R. D. Oxley, J. R. Lysaght, Esqrs., Ripon.	Employing seven women after 2 p.m. on Saturday.	7 0 0	4 4 0	
1865. Mar. 10	Geo. Mann, Leeds.	O. Nussey, Wm. Kelsall, J. Botterill, Esqrs., Town Hall, Leeds.	Not having limewashed his mill within the last fourteen months.	3 0 0	0 9 0	
„	Francis Malthouse, Leeds.	„ „	Neglecting to cause his son to attend school.	0 5 0	0 9 0	
„	„ „	„ „	Allowing his son to work more than 6½ hours.	1 0 0	0 11 6	
„ 20	Charles Hirst - -	Chas. Wheatley, W. B. Whatley, Balme, Esqrs., Court House, Dewsbury.	Neglecting to send notice of accident to certifying surgeon.	5 0 0	1 14 6	

LIST OF PROSECUTIONS—*continued*.

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Costs.	Amount of Penalty.	REMARKS.
1865.			*Informations laid by Mr. Rickards—continued.*	£ s. d.	£ s. d.	
Apr. 22	Wm. Watson, Cowling	J. R. Tennant, J. J. Lace, J. J. C. Lister, Esqrs., Town Hall, Skipton.	Employing a child for more than seven days without being certified.	2 0 0	0 14 6	
"	" "	" "	Neglecting to register the name of the above.	2 0 0	0 6 0	
"	John Snowden, Cowling.	" "	Neglecting to cause his child to attend school.	0 5 0	0 12 0	
"	" "	" "	Allowing the said child to work more than 6½ hours.	0 5 0	0 6 0	
			Informations laid by Mr. Whymper.			
"	Harney & Co., Sheffield	The Mayor, Wm. Fisher, and Thos. Jackson, Esqrs., Sheffield.	Employing a woman after 6 p.m.	2 0 0	0 6 0	At a former hearing the Magistrates had decided that the Defendant's premises were not a factory within the meaning of the Act. A case was then asked for to be decided in the Common Pleas, when the Judges unanimously decided that the Magistrates were wrong.
			Informations laid by Mr. Henderson.			
Mar. 29	John Hargreaves, jun., Healdmaker, Bacup.	John Howarth, Esq., John Dawson, Esq., and Richard Ashworth, Esq., Petty Sessions, Bacup.	Employing five females after 2 p.m. on Saturday -	5 0 0	3 12 6	

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
			Informations laid by Mr. Beadon.	£ s. d.	£ s. d.	
1865. April 27	Joseph Hanson	Wright Mellor and J. Beaumont, Esqs., (Huddersfield).	Employing a child (Sam Leach) for more than seven days without obtaining a surgical certificate.	2 0 0	0 7 0	
”	” ”	” ”	Employing a child without having its name on the factory register.	- -	0 6 0	Withdrawn on payment of costs.
”	” ”	” ”	Employing a child more than six hours and a half in one day.	- -	0 6 0	Withdrawn on payment of costs.
”	” ”	” ”	Employing a child without having obtained certificate of his school attendance for the previous week.	- -	0 6 0	Withdrawn on payment of costs.
”	James Leach	” ”	Permitting his child to be employed more than six hours and a half in one day.	0 5 0	0 7 0	
”	”	” ”	Neglecting to cause his said child to attend school.	- -	0 5 0	Withdrawn on payment of costs.
			Information laid by Mr. Oswald.			
”	John Robinson & Son, West End, Oldham.	E. A. Wright, Esq., J. Riley, Esq., Oldham.	Employing ten females during the dinner hour	10 0 0	4 10 0	

APPENDIX No. 2.

TABLE No. I.—*Accidents arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M&F.
Causing death - - -	8	1	4	2	2	–	14	3	17
Amputation of right hand or arm	9	3	7	1	–	–	16	4	20
Amputation of left hand or arm	5	–	1	–	1	–	7	–	7
Amputation of part of right hand	13	6	9	16	3	1	25	23	48
Amputation of part of left hand	8	3	7	18	–	–	15	21	36
Amputation of any part of leg or foot - - -	3	–	1	–	–	–	4	–	4
Fracture of limbs and bones of trunk - - - -	24	10	19	7	6	1	49	18	67
Fracture of hand or foot - -	22	32	26	32	8	6	56	70	126
Injuries to head and face - -	14	24	12	17	9	3	35	44	79
Lacerations, contusions, and other injuries not enumerated above - - - -	187	188	176	190	49	27	412	405	817
Total - -	293	267	262	283	78	38	633	588	1221

TABLE No. II.—*Accidents not arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M&F.
Causing death - - -	6	–	1	–	–	–	7	–	7
Fracture of limbs and bones of trunk - - - -	8	1	9	3	–	–	17	4	21
Fracture of hand or foot -	1	–	–	–	1	–	2	–	2
Injuries to head and face - -	9	1	4	2	3	–	16	3	19
Lacerations, contusions, and other injuries not enumerated above - - - -	30	12	16	4	3	1	49	17	66
Total - -	54	14	30	9	7	1	91	24	115

REPORT OF ROBERT BAKER Esq., Inspector of Factories, for the Three Months ended the 30th of April 1865.

Factory Inspectors' Office,
5th June 1865.

SIR,

SINCE my last Report to you, I have personally visited various earthenware and other works, and factories, in Bristol and the counties of Gloucester, Lancashire, Cheshire, Staffordshire, and Warwickshire. From all the sub-divisions of my district I continue to receive satisfactory accounts of the administration of the law; and there can be no longer any doubt now, that the wisdom of Parliament in assimilating the hours of employment one to another in various trades, will be productive of the happiest social and intellectual results.

Employment in the cotton districts appears to be resuming something of its characteristic activity, and there is, here and there, an inquiry for hands, which seems not unlikely, before long, to be very extensive, and may be important in its consequences with respect to the rate of wages.

Mr. Jones, Mr. Steen, and Mr. Bailey, three of the sub-inspectors of my division, superintend extensive cotton districts in Lancashire and Cheshire, and each of them reports to me that employment is becoming general, and that many mills which have been long standing, are now, if not in full, at least in general work. Indeed, the best criterion of the increasing production in the cotton trade is the state of the bleach works, which are working till eight o'clock at night, recovering the time which has been lost during the last four years, so far as it legally may be recovered. There are already opinions, privately expressed it is true, but, nevertheless, the sincere convictions, I have no doubt, of the masters, that in order to keep perfect fair play amongst them, there will need to be an abolition of the clause in the Bleaching Act which permits the recovery of lost time for any cause whatever, and an adoption of the Factory Act, pure and simple. It is only requisite, in order to prove the desirableness of the abolition of this clause, to show to what extent the construction of the words "time lost from any cause whatever" may be carried. It has recently been proposed to work up time stated to have been lost by a holiday, which the workpeople had taken for some festive occasion.

Mr. Sub-Inspector Jones reports of Bolton:—

"With respect to the present state of the cotton trade, I beg
" to say in general terms that it is rapidly improving. Every
" factory in my district is running full time. As a proof of it,
" wages have been advanced on all hands, and with but little
" demur on the part of the masters. In Bolton alone it is
" computed that there is a deficit of 1,000 hands. As far as

" can be gathered, the main cause of this scarcity of labour " is owing to the current of emigration from Bolton in the " earlier days of the panic." All the bleachers in his district are very busy, one of them having as much as 100 tons of cloth on hand. As a collateral branch of the trade, the fustian cutters are also very busy. So writes, at least, a most intelligent informant, who, in the month of May last thus expressed himself to me: "I am very " happy to inform you that cutting is now stirring up very " much, and that all the shops are now full of work, and we " are trying to get an advance in our trade, and I hope we " shall succeed, for we have been very low now for nearly " four years, and in the greatest distress. The cutters are " now very glad that we are under the law, as work is getting " plentiful, and they cannot put children under 11 years of " age to it, of which there is a great number that would be " put to it but for the law."

In a fortnight after this communication, I received the following from the same writer: " I am very glad to inform " you that work is now plentiful, and that we are getting all " our work advanced 3*s.* to 4*s.* There are several shops that " have been closed for a long time that are now being " opened."

Mr. Sub-Inspector Steen writes of Stockport—

" That a considerable improvement has lately taken place in the trade, more decidedly in Stockport than either Hyde or Wigan. In round numbers, at the height of the cotton famine, there were about two-thirds of the cotton machines standing and of the workers unemployed; now there is not more than one-fifth of the machinery standing. Notwithstanding the number of mills which are still unproductive (one-fifth), a very positive scarcity of hands is beginning to be felt at Stockport. There is machinery standing sufficient to employ 200 persons. As the mills which have lately resumed work get into further working order, this scarcity of hands is likely to be still more severely felt, not to speak of what it may be if this revival in trade should prove to be permanent, and sufficient to reopen the remaining factories.

" In consequence of the scarcity of labour there has not yet been any general increase in the rate of wages, though it is true, no doubt, that some masters, in order to attract workers to their establishments, which have for some time been closed, have had occasionally to give slightly increased wages. In a master's point of view it may be right to state that wages have increased, as more hands are now required to do the same amount of work, or to produce the same amount of yarn or cloth, than before the cotton famine, in consequence of the inferiority of the staple, so that the master has to pay more wages per pound on his production, although each worker receives no more than before.

" With respect to Hyde and the neighbourhood, there has been less improvement in the state of the cotton trade than in Stockport. During the distress, trade was very slack, at one period there being on an average five-sixths of the machiney standing. Several large factories have been recently re-opened, but some of them have not as yet had time to get into full operation. On the other hand, several of the largest factories remain unproductive. About one-fourth of the machinery is at the present time idle. Hands are therefore not so scarce.

"In nowhere has the cotton trade been worse than in Wigan. In the town itself for some time [there was scarcely a mill at work. In the neighbouring districts more was doing. Speaking roundly, there were about seven-eighths of the machinery standing. The improvement in the cotton trade has reached Wigan, but as yet has not made much progress. Several of the largest mills have recommenced a few weeks ago."

With respect to the employment of the cotton workers, Mr. Bailey writes of Burnley:—

" The popular belief that an almost unlimited quantity of " American cotton is about to be thrown into the English " market has set going the greater number of the mills " which have been standing in this district. Many of these, " before worked by firms now bankrupt, have changed hands. " Some entirely new establishments have commenced work, " whilst others are getting their machinery ready in order to " participate in the probable gains."

If there is yet a scarcity of hands, Mr. Bailey thinks it is confined to the weaving department—" The spinning concerns " have not lost any, though the spinners are beginning to " agitate for an advance of wages. There is, however, a " general advance of wages among the weavers. It varies in " amount, but, as a rule, it has not yet exceeded five per cent. " In some instances the increase is greater; but these are " exceptional cases, and arise from the fact, that the new " weaving firms entice hands from the older establishments, " by offering larger wages. The manufacturers anticipate " that the scarcity of labour will continue. But the unsatis- " factory character of American news makes thinking men " greatly doubt the healthiness of the present activity in the " trade, and renders them unable to look far forward."

It would thus appear that there is a general improvement in most, if not in all, branches of the cotton trade. That it will be fluctuating there can scarcely be a doubt, neither that the time is approaching when there will be a great competition for hands in all branches of textile labour. One can only hope that the past four years have inculcated the necessity of great mutual forbearance between masters and workers on all occasions, as well as the certainty, of all their interests being identical.

I am informed that the silk trade may be said to be "something better," and that there is a probability of wages advancing to a satisfactory amount by December next.

With respect to the earthenware and other new works now under the law, I have nothing to report to you but what is exceedingly satisfactory. I hope at the conclusion of the year to give you the actual results of legislation on these works, and to prove to you that all the benefits which could have been anticipated have been derived from it. I believe at this moment there are about 1,500 children at school in the Potteries proper, (not one of whom was under tuition at Christmas last,) and doing well, making useful progress, and under a discipline which will by-and-by extend to the works as well as school. I have visited some of these schools recently, and am astonished myself with the results which they already exhibit. The schoolmasters give the children credit for their attention and ability, and the parents pay the school pence with a reasonable punctuality. The children themselves come clean and orderly. For the most part, they are half-time workers. There are a few that are at school and work on alternate days. I hear of none of the difficulties of the half-time system now, which I did in the commencement.

Of the employment of children in the lace districts of Chard, Mr. Sub-Inspector Buller writes:—

" When I was at Chard the other day, I was glad to learn " that the factory school children have very much improved in " education, manners, and appearance since the introduction " of the Factory Act. The school to which they are sent " is the British and Foreign. On their being sent there at " first, the bulk of the other children were taken away, to " prevent their being brought in contact with such a very " rough set as the factory children were, and the school was " in consequence very much damaged. Now, however, the " factory children are considered by one of the trustees of the " school, and by the manager of the mill, to be so much " improved, that they hope this prejudice will no longer " exist."

The following grants have been made, with your sanction, from the Factory Fine Fund in my district, to schools where factory children are educated:

	£	s.	d.
To the Longton Factory School -	100	0	0
To the Taunton British School - -	20	0	0
To the St. James' School, Burnley -	25	0	0
To the National School, Trowbridge -	10	0	0
To the Coventry Sewing School -	20	0	0
	£ 175	0	0

The following gentlemen have been appointed to be certifying surgeons originally, or vice others deceased or resigned:—

ENGLAND.

Wm. Fredc. Foster, Esq., Newport, Isle of Wight.
J. J. Clapcott, Esq., Eversholt, Dorset.
J. Fernie, Esq., Stafford.
W. H. Pepler, Esq., Market Lavington, Wilts.
T. G. Dixon, Esq., Northwich, Cheshire.
J. H. Larmuth, Esq., Sale, Cheshire.
Job Harrison, Esq., Chester.
T. Nesbitt, Esq., Wolverhampton.
A. Samson, Esq., Weymouth, Dorset.
Ed. Morris, Esq., Plymouth, Devon.
Thos. Moore, Esq., Ardley Heath, Worcester.
John Francis, Esq., Market Harborough, Leicester.
Henry Walker, Esq., Brierly Hill, Stafford.
J. F. Williams, Esq., Newport Pagnell, Bucks.
B. Kerr, Esq., Crick, Northampton.
Andrew Fernie, Esq., Wellingborough, Bucks.
J. Foster, Esq., Daventry, Bucks.
J. H. Seward, Esq., Honiton, Devon.

WALES.

Ed. Davies, Esq., Wrexham
Wm. Jones, Esq., Ruabon.
G. C. Clarke, Esq., Mold.

IRELAND.

J. Macrum, Esq., M.D., Templepatrick.
Robert Little, Esq., Castle Dawson.
John Hawthorne, Esq., M.D., Banbridge.
T. Purefoy, Esq., M.D., Lucan.
T. Clancy, Esq., M.D., Mitchelstown.

I have the honour to be,
Sir,
Your most obedient Servant,
ROBERT BAKER.

The Right Hon.
the Secretary of State
for the Home Department.
&c. &c. &c.

APPENDIX No. 1.

RETURN of PROSECUTIONS for OFFENCES against the FACTORIES, &c. REGULATION ACTS, in the DISTRICT of ROBERT BAKER, ESQ., Inspector of Factories, during the Six Months ended 30th April, 1865.

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
			Informations laid by Mr. Kent.	£ s. d.	£ s. d.	
1865. Jan. 5.	Thos. Morgan, Senr., Talybont.	Price Price, Esq., and G. Williams, Esq., Twenddol.	Employing a young person at night.	2 0 0	0 10 0	
”	” ”	” ”	Employing a young person at night.	2 0 0		
”	Thos. Morgan, Junr., Talybont.	” ”	Employing a young person after 2 o'clock on Saturday.	1 0 0	0 5 0	
”	” ”	” ”	Employing a young person at night.	2 0 0	0 5 0	
”	D. Morgan, Talybont.	” ”	Employing a young person at night.	2 0 0	0 5 0	
”	” ”	” ”	Employing a young person without entering the name and date of first day of employment in the register.	2 0 0	0 5 0	
			Informations laid by Mr. Darkin.			
1864. Dec. 17.	John and Joseph Carr, flax spinners, Tulligirven, county Down.	R. A. O'Donnell, Esq., R.M., and the Rev. J. Bradshaw.	Employing eight females and young persons after 7 o'clock in the evening, (they being entitled to work till seven,)being the second offence of the same kind within twelve months.	6 0 0	1 0 0	The manager having urged that his employers had given him strict orders to observe the law, and stated several facts in extenuation of the offence, four cases were withdrawn on payment of costs.

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
				£ s. d.	£ s. d.	
1865. Feb. 14.	Waring and Duncan, flax spinners, Ligoniel, near Belfast.	John Lytle, Esq., Mayor, Edward Orme, Esq., R.M., and J. C. O'Donnell, Esq., R.M.	Employing five females after 6 o'clock in the evening, being the second offence of the same kind within twelve months.	7 10 0	0 12 6	
			Informations laid by Mr. Steen.			
1864. Dec. 28.	James Marshall, cotton spinner and manufacturer, Portwood, Stockport.	Wm. Linton Eskrigge, Esq., Mayor, John Eskrigge, Esq., Richard Sykes, Esq., Cephas Howard, Esq., William Williamson, Esq., Stockport Petty Sessions.	Employing ten children without school certificates.	30 0 0	5 16 8	
"	" "	" "	Employing eight young persons without surgical certificates.	8 0 0	4 13 4	
"	" "	" "	Employing one child without registration.	1 0 0	0 13 0	
"	" "	" "	Employing two children without registration.	- -	3 17 0	Withdrawn on payment of costs.
"	" "	" "	Employing ten children more than six hours and thirty minutes.	- -		
"	" "	" "	Employing eight young persons without registration certificates.	- -		
"	" "	" "	Employing two children without surgical certificates.	- -		
	John Porter, an overlooker employed in Mr. John Marshall's as above.	" "	Wilful obstruction of the Sub-Inspector in the execution of his office, by concealing a number of children and young persons from examination.	5 0 0	0 8 0	

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing,	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
			Informations laid by Mr Steen—continued.	£ s. d.	£ s. d.	
1865. Jan. 2.	William Bowden, factory operative, Stockport.	William Williamson, Esq., Ephraim Hallam, Esq., Stockport Petty Sessions.	For a parent wilfully permitting the illegal employment of his child at Mr. James Marshall's factory, in working more than six hours and thirty minutes each day, and not causing him to attend school.	0 5 0	0 11 0	
„ 9	Robert Callan, fustian cutter, Warrington.	Peter Smith, Esq., Mayor, Henry White, Esq., Warrington Petty Sessions.	Employing two young persons without registration	- -	0 11 0	Withdrawn on payment of costs.
„	Edward Robinson, fustian cutter, Warrington.	„ „	Employing one young person without registration	- -	0 6 6	Withdrawn on payment of costs.
„	John Clare, fustian cutter, Warrington.	„ „	Employing one young person without registration	- -	0 5 6	Withdrawn on payment of dosts.
Mar 28.	Bushby and Atkin, flax spinners and manufacturers, Farnworth.	R. Pilkington, Esq., Captn. Hornby, J. Bilby, Esq., W. Pilkington, Junior, Esq., St. Helens Petty Sessions.	Employing eight children and young persons without surgical certificates.	- -	3 5 11	Withdrawn on payment of costs.
			Informations laid by Mr. Buller.			
1865. Mar. 8	John Boyd, Castle Cary, Somerset.	Wm. Stuckey Wood, Esq., Dalton Foster Grant Dalton, Esq., Magistrates' Office, Wincanton.	Employing six children without surgical certificates.	1 0 0	1 13 6	Five cases withdrawn on payment of costs.
„	„ „	„ „	Employing three children without having registered their names, &c.	- -		Withdrawn on payment of costs.

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
1864.			*Informations laid by Mr. May.*	£ s. d.	£ s. d.	
Nov. 10	Wise and Leonard, Nailsworth, Glo'stershire.	A. B. Rooke and G. C. Hayward, Esq., Horsley, Glo'stershire.	Employing four young persons and two children without registering their names.	4 0 0	1 1 0	Four informations withdrawn on payment of costs.
"	" "	" "	Employing four young persons and two children for more than thirteen working days without surgical certificates.	6 0 0		Three informations withdrawn on payment of costs.
"	" "	" "	Employing two children without obtaining school certificate for foregone week.	2 0 0		
"	" "	" "	Employing two children before noon and after 1 o'clock p.m. on the same day.	2 0 0		
1865. Jan. 26	Wilkinson & Sons, Hanley, Staffordshire.	Henry Pidduck & Joseph Clementson, Esqs., Hanley.	Employing a young person for more than seven working days without surgical certificate.	2 0 0	0 14 0	
"	Samuel Johnson, Hanley.	" "	Neglecting to send notice on beginning to occupy a factory.	- -	0 9 6	Information withdrawn on payment of costs.
"	Thomas Cooper, Hanley.	" "	Employing five females and young persons later than 7 o'clock in the evening.	5 0 0	3 5 0	
"	" "	" "	Employing a young person after 7 o'clock in the evening.	- -	1 10 6	Dismissed.
"	" "	" "	Employing a female and a young person after 7 o'clock in the evening.	- -		Withdrawn.
Feb. 16	George F. Bowers, Tunstall, Staffordshire.	James E. Davis, Esq., stipendiary magistrate, Tunstall.	Employing four females and one child after 2 o'clock in the afternoon on Saturday.	1 0 0	1 3 6	Four informations withdrawn on payment of costs.

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, & Place of Hearing.	Nature of Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
1865.			*Informations laid by Mr. May*—continued.	£ *s.* *d.*	£ *s.* *d.*	
Mar. 31	Robert Auckland, workman, Stoke-upon-Trent.	James E. Davis, Esq., stipendiary magistrate, Tunstall.	Employing a child before noon and after 1 o'clock p.m. on the same day.	1 0 0	- -	Fifteen shillings of the penalty was subsequently remitted by the Secretary of State.
April 4	Joseph Sherratt, Burslem	" "	Allowing his child to be employed before noon and after 1 o'clock p.m. on the same day.	0 5 0	1 0 0	
			Informations laid by Mr. Earnshaw.			
Feb. 17	Robert Hastings, Stroud	S. S. Dickinson & M. Wyatt, Esqs., Stroud.	Employing a child of 12 as if a young person without a surgical certificate, and notwithstanding the surgeon's refusal to certify.	2 10 0	3 1 0	
Mar. 3 by adjournment from Mar. 2 for want of two magistrates.	Edward Wise, of Woodchester.	T. A. Stoughton and A. B. Rooke, Esqs. Subscription Rooms, Nailsworth, by adjournment of Sessions from the day before at Horsley.	Employing James Webb without surgical certificate.	- -	- -	Withdrawn on proof that he was sixteen at date of employment.
	" "	" "	Employing said James Webb without having registered his name.	- -	- -	Withdrawn on Mr. Wise's admission of the fact and regret.
"	" "	" "	Employing a young person without registering his name.	1 0 0	0 9 0	
"	" "	" "	Employing the same young person without a surgical certificate.	1 0 0	0 9 0	
"	John Grist, of Rooksmore	" "	Employing three young persons without surgical certificates.	1 0 0	2 17 0	Two cases withdrawn on payment of costs.
		" "	Employing two of the same young persons without being registered.	1 0 0		One case withdrawn on payment of costs.

LIST OF PROSECUTIONS—*continued.*

Date.	Names and Addresses of Persons summoned.	Names of the Magistrates who heard the Case, and Place of Hearing.	Nature of the Offence.	Amount of Penalty.	Amount of Costs.	REMARKS.
			Informations laid by Mr. Earnshaw—continued.	£ *s.* *d.*	£ *s.* *d.*	
Mar. 3 by adjournment from Mar. 2 for want of two magistrates.	Alfred Apperley, Dudbridge.	Subscription Rooms, Nailsworth, by adjournment of Sessions from the day before at Horsley.	1. Employing Emma Baker without surgical certificate.	- -	- -	Dismissed.
	” ”	” ”	2. Employing Emma Young without surgical certificate.	- -	- -	Dismissed.
”	” ”	” ”	3. Employing Sarah Davies without surgical certificate for a longer period than seven days.	- -	- -	Dismissed.
”	” ”	” ”	4. Employing Martha Hemmings without surgical certificate for a longer period than seven days.	- -	- -	Dismissed.
”	” ”	” ”	5. Employing Maria Sherman without surgical certificate for a longer period than seven days.	- -	0 9 6	Withdrawn on payment of costs.

APPENDIX No. 2.

TABLE No. I.—*Accidents arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.& F.
Causing death - - -	2	1	1	–	1	–	4	1	5
Amputation of right hand or arm	3	2	3	1	–	–	6	3	9
Amputation of left hand or arm	–	–	3	–	1	–	4	–	4
Amputation of part of right hand	4	1	6	8	1	–	11	9	20
Amputation of part of left hand	3	3	5	5	–	1	8	9	17
Fracture of limbs and bones of trunk - - - -	5	3	7	2	–	–	12	5	17
Fracture of hand or foot - -	9	5	4	9	1	1	12	15	29
Injuries to head and face -	2	10	6	4	3	1	11	15	26
Lacerations, contusions, and other injuries not enumerated above - - -	66	45	76	73	11	7	153	125	278
Total - -	94	70	111	102	18	10	223	182	405

TABLE No. II.—*Accidents not arising from Machinery.*

Nature of Injury.	Adults.		Young Persons.		Children.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.& F.
Causing death - - -	3	–	2	–	–	–	5	–	5
Amputation of right hand or arm	–	–	1	–	–	–	1	–	1
Fracture of limbs and bones of trunk - - - -	4	4	3	1	1	1	8	6	14
Injuries to head and face -	3	3	1	2	–	–	4	5	9
Lacerations, contusions, and other injuries not enumerated above - - -	16	4	5	1	2	–	23	5	28
Total - -	26	11	12	4	3	1	41	16	57

LONDON:
Printed by George E. Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

MINES.

REPORTS

OF

THE INSPECTORS OF MINES,

TO

HER MAJESTY'S SECRETARY OF STATE,

For the Year 1864.

Mr. DUNN.
Mr. ATKINSON.
Mr. DICKINSON.
Mr. HIGSON.
Mr. EVANS.
Mr. WYNNE.
Mr. BROUGH.
Mr. BAKER.
Mr. WALES.
Mr. MOORE.
Mr. ALEXANDER.
Mr. MORTON.

Presented to both Houses of Parliament by Command of Her Majesty.

LONDON:
PRINTED BY GEORGE EDWARD EYRE AND WILLIAM SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.
FOR HER MAJESTY'S STATIONERY OFFICE.
1865.

11980.

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SUMMARIES.

SUMMARY of Separate FATAL ACCIDENTS in and about the COAL MINES of GREAT BRITAIN during the Year 1864.

Names of Districts.	Explosions of Fire Damp.	Falls in Mine.			In Shafts.									Miscellaneous Underground.									On Surface.				Gross Totals.
		Falls of Coal.	Falls of Roof.	Total Falls in Mine.	Overwinding.	Ropes and Chains breaking.	Whilst ascending or descending.	Falling into Shaft from Surface.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gun-powder.	Suffocation by Gases.	Irruptions of Water.	Falling into Water.	On Inclined Planes.	By Trams and Tubs.	By Machinery Under-ground.	Sundries Underground.	Total Miscellaneous Underground.	By Machinery on Surface.	Boilers bursting.	Miscellaneous on Surface.	Total on Surface.	
Northumberland, Cumberland, and North Durham - -	1	6	24	30	–	1	2	2	–	1	–	3	9	2	1	–	–	–	5	1	2	11	3	–	9	12	63
South Durham - - -	2	–	30	30	–	–	–	3	2	5	–	5	15	–	–	–	–	5	16	2	1	24	3	2	7	12	83
North and East Lancashire -	5	9	20	29	1	1	2	1	1	6	1	–	13	2	2	–	–	2	3	1	–	10	–	–	3	3	60
West Lancashire and North Wales - - - -	7	8	32	40	1	–	6	6	–	5	3	1	22	1	3	1	1	2	4	–	–	12	1	–	9	10	91
Yorkshire - - - -	4	11	16	27	–	2	4	1	1	1	3	3	15	1	–	–	–	–	2	–	–	3	1	1	–	2	51
Derbyshire, Nottinghamshire, Leicestershire, and Warwickshire - - - -	9	5	25	30	–	1	2	–	2	–	–	4	9	4	1	–	–	4	3	–	2	14	–	–	2	2	64
North Staffordshire, Cheshire, and Shropshire - - -	13	4	9	13	–	2	1	4	–	3	1	–	11	1	1	–	–	1	2	–	–	5	2	–	1	3	45
South Staffordshire and Worcestershire - - -	7	36	12	48	2	2	6	6	–	1	3	11	31	–	–	–	–	–	–	–	3	3	2	–	4	6	95
Monmouthshire, Gloucestershire, Somersetshire, and Devonshire - - -	3	10	21	31	–	–	3	–	–	2	1	5	11	2	–	–	–	1	8	1	–	12	1	–	2	3	60
South Wales - - - -	4	13	53	66	–	–	1	2	–	–	–	2	5	1	–	–	2	3	12	–	–	18	1	–	7	8	101
Eastern district of Scotland -	1	12	10	22	1	–	2	–	–	1	–	2	6	–	–	–	–	1	1	–	–	2	–	–	2	2	33
Western do. -	3	4	10	14	–	–	3	–	1	4	3	–	11	1	–	–	–	1	–	–	1	3	–	–	–	–	31
Total separate fatal accidents - - in 1864	59	118	262	380	5	9	32	25	7	29	15	36	158	15	8	1	3	20	56	5	9	117	14	3	46	63	777
in 1863	51	137	261	398	9	10	29	23	8	13	12	22	126	18	4	4	3	27	59	3	8	126	10	2	44	56	757
																								Increase - -			20

SUMMARY of DEATHS caused by the aforesaid ACCIDENTS in and about the COAL MINES of GREAT BRITAIN during the Year 1864.

Names of Districts.	Explosions of Fire Damp.	Falls in Mine.			In Shafts.									Miscellaneous Underground.									On Surface.				Gross Totals.
		Falls of Coal.	Falls of Roof.	Total Falls in Mine.	Overwinding.	Ropes and Chains breaking.	Whilst ascending or descending.	Falling into Shaft from Surface.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gun-powder.	Suffocation by Gases.	Irruptions of Water.	Falling into Water.	On Inclined Planes.	By Trams and Tubs.	By Machinery Under-ground.	Sundries Underground.	Total { Miscellaneous Underground.	By Machinery on Surface.	Boilers bursting.	Miscellaneous on Surface.	Total on Surface.	
Northumberland, Cumberland, and North Durham - -	7	6	24	30	–	1	2	2	–	1	–	3	9	2	1	–	–	–	5	1	2	11	3	–	9	12	69
South Durham - - -	3	–	30	30	–	–	-	3	2	6	–	5	16	–	–	–	–	5	16	2	1	24	3	6	7	16	89
North and East Lancashire -	5	10	23	33	1	1	2	1	1	6	1	–	13	2	2	–	–	2	3	1	–	10	–	–	3	3	64
West Lancashire and North Wales - - - -	10	8	35	43	2	–	10	7	–	5	3	1	28	1	3	8	1	2	4	–	–	19	1	–	9	10	110
Yorkshire - - - -	6	11	16	27	–	2	4	1	1	1	3	3	15	1	–	–	–	–	2	–	–	3	1	3	–	4	55
Derbyshire, Nottinghamshire, Leicestershire, and Warwickshire - - - -	11	5	25	30	–	1	2	–	2	–	–	4	9	4	1	–	–	4	3	–	2	14	–	–	2	2	66
North Staffordshire, Cheshire, and Shropshire - - -	22	4	9	13	–	2	1	4	–	3	1	–	11	1	1	–	–	1	2	–	–	5	2	–	1	3	54
South Staffordshire and Worcestershire - - -	12	38	13	51	4	10	7	6	–	1	3	16	47	–	–	–	–	–	–	–	3	3	2	–	4	6	119
Monmouthshire, Gloucestershire, Somersetshire, and Devonshire - - -	6	11	22	33	–	–	4	–	–	2	–	7	13	2	–	–	–	1	8	1	–	12	1	–	2	3	67
South Wales - - - -	6	13	54	67	–	–	1	2	–	–	–	3	6	1	–	–	2	3	12	–	–	18	1	–	7	8	105
Eastern district of Scotland -	1	12	11	23	1	–	2	–	–	1	–	2	6	–	–	–	–	1	1	–	–	2	–	–	2	2	34
Western do. -	5	4	11	15	–	–	3	–	1	4	3	–	11	1	–	–	–	2	–	–	1	4	–	–	–	–	35
Total lives lost in 1864 - -	94	122	273	395	8	17	38	26	7	30	14	44	184	15	8	8	3	21	56	5	9	125	14	9	46	69	867
Do. do. in 1863 - -	163	138	269	407	12	12	39	23	8	16	13	24	147	19	5	10	3	27	59	3	8	134	10	2	44	56	907
																							Decrease - -				40

SUMMARY of Separate FATAL ACCIDENTS in and about the INSPECTED IRONSTONE MINES of GREAT BRITAIN during the Year 1864.

Names of Districts.	Explosions of Fire Damp.	Falls in Mine.			In Shafts.									Miscellaneous Underground.									On Surface.				Gross Totals.
		Falls of Ironstone.	Falls of Roof.	Total Falls in Mine.	Overwinding.	Ropes and Chains breaking.	Whilst ascending or descending.	Falling into Shaft from Surface.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder.	Suffocation by Gases.	Irruptions of Water.	Falling into Water.	On Inclined Planes.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total Miscellaneous Underground.	By Machinery on Surface.	Boilers bursting.	Miscellaneous on Surface.	Total on Surface.	
Northumberland, Cumberland, and North Durham - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
South Durham - - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
North and East Lancashire -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
West Lancashire and North Wales - - - - -	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Yorkshire - - - - -	–	–	2	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Derbyshire, Nottinghamshire, Leicestershire, and Warwickshire - - - - -	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
North Staffordshire, Cheshire, and Shropshire - - -	–	–	6	6	–	2	2	3	–	–	–	–	7	2	–	–	–	1	–	–	–	3	–	–	–	–	16
South Staffordshire and Worcestershire - - -	6	9	2	11	–	–	1	–	–	1	–	–	2	–	2	–	–	–	–	1	–	3	–	–	2	2	24
Monmouthshire, Gloucestershire, Somersetshire, and Devonshire - - -	–	–	10	10	–	–	4	–	–	–	–	–	4	1	–	–	–	–	2	–	–	3	–	–	–	–	17
South Wales - - -	–	–	7	7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	7
Eastern District of Scotland -	–	1	1	2	–	–	–	–	–	–	–	2	2	–	–	–	–	–	1	–	–	1	–	–	–	–	5
Western ditto - -	1	1	4	5	–	–	–	1	–	2	–	–	3	2	–	–	–	1	–	–	–	3	1	1	–	2	14
Total separate fatal accidents in 1864	7	11	32	43	–	2	8	5	–	3	–	2	20	5	2	–	–	2	3	1	–	13	1	1	2	4	87
Total separate fatal accidents in 1863	8	7	32	39	–	–	8	7	1	2	4	2	24	2	1	–	1	2	2	–	1	9	3	–	4	7	87
																							Equal - -				—

SUMMARY of DEATHS caused by the aforesaid ACCIDENTS in and about the INSPECTED IRONSTONE MINES of GREAT BRITAIN during the Year 1864.

Names of Districts.	Explosions of Fire Damp.	Falls in Mine.			In Shafts.									Miscellaneous Underground.									On Surface.				Gross Totals.
		Falls of Ironstone.	Falls of Roof.	Total Falls in Mine.	Overwinding.	Ropes and Chains breaking.	Whilst ascending or descending.	Falling into Shaft from Surface.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gun-powder.	Suffocation by Gases.	Irruptions of Water.	Falling into Water.	On Inclined Planes.	By Trams and Tubs.	By Machinery Under-ground.	Sundries Underground.	Total { Miscellaneous Underground.	By Machinery on Surface.	Boilers bursting.	Miscellaneous on Surface.	Total on Surface.	
Northumberland, Cumberland, and North Durham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
South Durham	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
North and East Lancashire	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
West Lancashire and North Wales	–	–	–	–	–	–	1	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Yorkshire	–	–	2	2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Derbyshire, Nottinghamshire, Leicestershire, and Warwickshire	–	–	–	–	–	–	–	1	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	1
North Staffordshire, Cheshire, and Shropshire	–	–	6	6	–	2	10	3	–	–	–	–	15	2	–	–	–	1	–	–	–	3	–	–	–	–	24
South Staffordshire, and Worcestershire	6	9	2	11	–	–	1	–	–	–	1	–	2	–	3	–	–	–	–	1	–	4	–	–	2	2	25
Monmouthshire, Gloucestershire, Somersetshire, and Devonshire	–	–	10	10	–	–	4	–	–	–	–	–	4	1	–	–	–	–	2	–	–	3	–	–	–	–	17
South Wales	–	–	7	7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	7
Eastern district of Scotland	–	1	1	2	–	–	–	–	–	–	–	2	2	–	–	–	–	–	1	–	–	1	–	–	–	–	5
Western do.	1	1	4	5	–	–	–	1	–	2	–	–	3	2	–	–	–	1	–	–	–	3	1	1	–	2	14
Total lives lost in 1864	7	11	32	43	–	2	16	5	–	2	1	2	28	5	3	–	–	2	3	1	–	14	1	1	2	4	96
Do. do. in 1863	9	7	32	39	–	–	8	9	2	2	4	2	27	2	1	–	1	2	2	–	1	9	3	–	4	7	91
																							Increase - -				5

SHOWING

The Number of Male Coal Miners Employed in and about the Coal Mines of Great Britain, the Number of Fatal Accidents and Lives Lost, the Quantity of Coal Raised, and the Proportion of Accidents and Lives Lost to the Number of Persons Employed and the Tons of Coal Raised.

Names of Districts.	Number of Male Coal Miners Employed as per Census 1861.	In the Year 1864.								
		As computed by each Inspector for his own District.		Separate Fatal Accidents.	Lives Lost by the Accidents.	Persons Employed per Separate Fatal Accident.	Persons Employed per Life Lost.	Tons of Coal Raised per Separate Fatal Accident.	Tons of Coal Raised per Life Lost.	Number of Collieries.
		Number of Male Persons Employed.	Quantity of Coal Raised.							
Northumberland, Cumberland, and North Durham	22,719	24,423	10,156,000	63	69	388	354	161,206	147,188	165
South Durham - - - - -	30,805	33,115	13,835,544	83	89	399	372	166,693	155,456	160
North and East Lancashire - -	23,525	23,525	5,998,875	60	64	392	367	99,981	93,732	282
West Lancashire and North Wales - -	24,302	24,302	7,500,000	91	110	267	221	82,417	68,181	180
Yorkshire - - - -	31,938	34,500	9,300,000	51	55	676	627	182,353	169,091	419
Derby, Nottingham, Leicester, and Warwickshire	23,434	26,600	7,300,000	64	66	415	403	114,063	110,606	205
North Stafford, Cheshire, and Shropshire - -	16,427	19,500	5,200,000	45	54	433	361	115,555	96,296	222
South Stafford and Worcestershire - -	25,235	26,620	10,206,000	95	119	280	224	107,431	85,764	540
Monmouth, Gloucester, Somerset, and Devonshire	21,762	26,658	5,978,500	60	67	444	397	99,641	89,231	225
South Wales - - - -	26,292	29,076	6,948,000	101	105	288	277	68,792	66,171	332
Scattered over other Counties - - -	148									
Totals,—England and Wales - - -	246,587	268,319	82,422,919							
East Scotland - - -	18,091	21,150	6,400,000	33	34	641	622	193,939	188,235	270
West Scotland - - - - -	17,795	18,073	6,300,000	31	35	583	516	203,225	180,000	220
Totals, Scotland - - -	35,886	39,223	12,700,000							
Totals and Averages, England, Wales, and Scotland - - -	282,473	307,542	95,122,919	777	867	395	354	122,423	109,715	3,220

Mr. Dunn's Report.

REPORT as to the MINE INSPECTION ACT in the NORTHERN DISTRICT, in the Year 1864.—By MATTHIAS DUNN, Esq.

AN ACCOUNT of DEATHS by ACCIDENT in the COLLIERIES of the NORTHERN DISTRICT, from 31st December 1863 to 31st December 1864, viz. :—

		—	In Shafts.	Explosions.	Falls of Stone and Coal.	Sundries above Ground.	Sundries below Ground.	Total.
1864 :—								
January	1	Seaton Delaval, threw himself down pit	1	–	–	–	–	1
„	6	Tanfield Moor, putter, fall of stone	–	–	1	–	–	1
„	„	Springwell, boy, above ground railway	–	–	–	1	–	1
„	7	Cowpen, fall of stone	–	–	1	–	–	1
„	„	Tanfield Lea, found dead	–	–	–	–	–	–
„	9	Seghill, crushed by cage above ground	–	–	–	1	–	1
February	5	Ellenborough, threw himself down shaft	1	–	–	–	–	1
„	6	Bebside, in contact with cage at surface	1	–	–	–	–	1
„	10	Usworth, crush of tubs	–	–	–	–	1	1
„	13	Kibblesworth, by coal waggons	–	–	–	1	–	1
„	14	Eshott, breakages of pit rope	1	–	–	–	–	1
„	16	Seghill, engine plane, underground	–	–	–	–	1	1
„	„	Harton, fall of stone	–	–	1	–	–	1
„	17	Cleator Moor, suffocated by choke damp	–	–	–	–	1	1
„	18	Hilda, by premature fire of shot	–	–	–	–	1	1
„	25	Marley Hill, fall of stone	–	–	1	–	–	1
„	26	Heworth, do.	–	–	1	–	–	1
„	27	Harton, do. non-fatal	–	–	–	–	–	–
„	„	Flimby, do.	–	–	1	–	–	1
„	29	Usworth, do.	–	–	1	–	–	1
March	2	Marley Hill, fall of stone	–	–	1	–	–	1
„	10	Garesfield, killed on railway	–	–	–	1	–	1
„	15	Monkwearmouth, crush of tubs	–	–	–	–	1	1
„	„	Cowpen, fall of stone	–	–	1	–	–	1
„	17	Choppington, tubs at bottom of shaft	1	–	–	–	–	1
„	18	Hilda, premature fire of shot	–	–	–	–	1	1
April	12	Gosforth, crush of tubs, inclined plane	–	–	–	–	1	1
„	„	Aspatria, fall of coal	–	–	1	–	–	1
„	13	Marley Hill, fall of stone	–	–	1	–	–	1
„	20	Heworth, crush of tubs	–	–	–	–	1	1
„	26	Ilsworth, fall of stone	–	–	1	–	–	1
„	28	Harton, do.	–	–	1	–	–	1
May	5	Killingworth, under engine plane	–	–	–	–	1	1
„	10	Broughton Moor, coal waggons above ground	–	–	–	1	–	1
June	6	North Seaton, crab above ground, boy	–	–	–	1	–	1
„	10	Medomsley, fall of stone	–	–	1	–	–	1
„	17	Mickley, run over by tubs below	–	–	–	–	1	1
„	27	Barrington, fall of coal	–	–	1	–	–	1
July	4	South Tyne Company, fall of stone	–	–	1	–	–	1
„	6	Seaton Delaval, do.	–	–	1	–	–	1
„	10	Harton, fall of coal	–	–	1	–	–	1
„	12	Blaydon Main, fall of stone	–	–	1	–	–	1
„	15	Gosforth, crush of tubs	–	–	–	–	1	1
August	3	West Cramlington, woman run over by waggons	–	–	–	1	–	1
„	4	Felling, fell out of cage	1	–	–	–	–	1
„	„	Lintz, fall of stone	–	–	1	–	–	1
„	9	Springwell, do.	–	–	1	–	–	1
		Carried forward	6	–	21	7	11	45

		In Shafts.	Explosions.	Falls of Stone and Coal.	Sundries above Ground.	Sundries below Ground.	Total.
1864:—	Brought forward - - - -	6	–	21	7	11	45
August 10	Flimby, woman killed by waggons - - -	–	–	–	1	–	1
,, 13	Ratcliffe, fall of stone - - - -	–	–	1	–	–	1
September 9	Seghill, explosion of gas - - - - -	–	7	–	–	–	7
,, 15	Flimby, fall of engine framing - - - -	–	–	–	1	–	1
October 1	Team, killed by cage - - - - - -	1	–	–	–	–	1
,, 7	Seaton Delaval, on waggon way - - -	–	–	–	1	–	1
,, 8	Bebside, at bottom of shaft - - - -	1	–	–	–	–	1
,, ,,	Burradon, fall of coal - - - - - -	–	–	1	–	–	1
,, 9	Team, fell down staple - - - - - -	1	–	–	–	–	1
,, 14	Backworth, fall of coal - - - - - -	–	–	1	–	–	1
November 18	Cramlington, fall of stone - - - - - -	–	–	1	–	–	1
,, 28	Wylam, crush of waggons - - - - -	–	–	–	1	–	1
,, ,,	Broom Hill, fall from pit heap - - - -	–	–	–	1	–	1
December 8	West Cramlington, fall of stone - - -	–	–	1	–	–	1
,, 14	Whitehaven, do. - - - -	–	–	1	–	–	1
,, ,,	Mickley, do. - - - -	–	–	1	–	–	1
,, 16	Cleator Moor, fall of coal - - - - -	–	–	1	–	–	1
,, 20	Backworth, fall of stone - - - - -	–	–	1	–	–	1
	Total - - - - -	9	7	30	12	11	69

Notwithstanding the progressive increase of quantities of coal raised, and the additional number of persons employed during the last year. I feel much gratified in being able to present a statement shewing a remarkable diminuation of deaths by accident as compared with former years, viz. :

By the above it will be seen that the year 1864 is free from explosions of gas, with one exception, viz., that at Seghill Colliery, on the 9th September, whereby seven lives were lost which may be attributed mainly to the satisfactory working of the Mine Inspection Act, and to the general precautions arising therefrom.

Under the head of Shaft Accidents are included two cases, one on the 1st January at Seaton Delaval, and the other at Ellenborough in Cumberland on the 14th February, where two unfortunate persons wilfully threw themselves down the shaft without any ostensible cause.

Under the head of Breakage of Ropes a case ocurred at Eshott, a little Landsale Colliery near Acklington, Northumberland. The pit was only 14 fathoms deep, the coals drawn by means of a horse gin fitted up with round hempen ropes. The rope, otherwise sufficiently strong and good for the purpose, had been temporarily applied to some heavy lifts in the engine shaft, and became thereby strained and broken, whence the splicing had been ignorantly and unskilfully accomplished, so that when applied to its ordinary purpose at the horse gin it suddenly broke whilst drawing up a single man, who was killed outright; the circumstances were closely investigated before Mr. Hardy, the coroner, and jury; but a verdict of accidental death was recorded.

October 9th.—A death is recorded at Team Colliery, by which under a mistake between deceased and the onsetter at the bottom of the pit he was crushed in the act of getting out of the cage, but he should have remained in until the proper signal was given. A regular attendance at the shaft was shown to be provided, as well as regular rules.

The other shaft accidents are all occasioned by casual circumstances with the cage,—one being caught unexpectedly at bottom of shaft, whilst another fell out without explanation as to the cause.

Falls of Stone and Coal.

Five deaths have occurred from the top coal having fallen upon the hewer, after it had been undermined and undefended by a diagonal stay or spragg; the falls of roof do not demand any peculiar explanation; in all the cases recorded it was shown that due regard had been paid to the provision of timber and attendance, it being admitted that it is the duty of the overmen and deputies to see to these matters, and to be accountable for all due care of the men; but in the most of the cases arising from unseen falls, it was discovered that the causes were from invisible slips in the stone or otherwise, the only safeguard is by a temporary diagonal stay or prop the duty of providing which, necessarily devolves upon the workman while he is undermining the coal.

Under the head of sundries underground, is a case at Cleator Moor, in Cumberland, on the 17th February, which showed a reprehensible and entire want of prudential arrangement.

It was the death of a poor man in No. 2 pit by choke damp, by permitting some of the whole coal workings to be so inadequately ventilated that they became so filled with gas as to overpower one of the men who had straggled thither by mistake, and was dead before being extricated.

Considerable excitement prevailed upon the occasion on the premises, and serious warnings were given to the manager in future.

The other miscellaneous accidents are,—on underground planes, 3; crush of cages and tubs, 8; premature firing of shots, 3. No very prominent circumstances attach to these events, being accidental.

Also, there are *five lives* lost on above-ground railways by boys and strangers being unguardedly overtaken by coal waggons, and also about pit heaps, arising from riding on waggons contrary to the established rules of the colliery.

Schools.

I have by circular and otherwise endeavoured to ascertain the condition of the working population with regard to education, and am glad to report that scarcely any boys are at work under 12 years of age, either above ground or below.

The means of education are very extensively carried out, the chief collieries either possessing schools of their own, or being made to attend the neighbouring schools, the owners contributing to the support of the master in various degrees. As I am unable to define any conformable system, I have taken the liberty of inserting the rules and regulations applicable to the school at Seghill Colliery, near Newcastle-on-Tyne, which seems to work very well.

At Monkwearmouth, an extensive school is under Government inspection, but such arrangement is not very popular, the Dissenters not liking to be under the specific rules ordained in the Church schools.

Upon the whole, there is a great increase going on in school instruction, with every prospect of being further extended.

" *Rules and Regulations of the Seghill Colliery Schools*, 1861.

" 1st. The object of this society is to establish and maintain a day school for boys, and, as far as the committee can arrange, a night school in conjunction therewith; also a separate school for girls; and this society shall be an institution of the colliery, and shall not be dissolved except with the unanimous consent of the owners and workmen.

" 2d. The owners of the colliery shall provide two suitable schools, one for boys, and one for girls, together with coals; also a house and firing for the master.

" 3d. The schools to be supported by the contributions of all the men employed upon the colliery, in the following ratio :—every householder to contribute sixpence, and every man, not being a householder and above eighteen years of age, threepence per fortnight; and any farm servant that may contribute the same amount as the colliery workmen shall be entitled to equal benefits; also the son of any widow on the colliery (though under eighteen years of age) contributing the same as a householder, shall have the benefits of the schools extended to himself, his brothers, and sisters.

" 4th. The sum so subscribed to form a fund, out of which the teachers shall be paid, and books found for the use of the schools; should any surplus remain, it shall be distributed annually in prizes to the scholars as a reward of merit, if the committee shall so think fit.

" 5th. Children above five years of age, of all contributors, shall be admitted to the schools; and any contributor not having children of his own, may nominate one scholar, the child of any person not belonging to the colliery, which pupil shall be entitled to all the privileges of the school.

" 6th. The government of the schools shall be vested in a president, vice-president, and committee of ten; one of the owners of the colliery shall be president, and shall appoint three members of the committee, one of whom shall act as treasurer; the vice-president and the six remaining members of the committee shall be elected by the contributors annually; the president and vice president shall be *ex-officio* members of every committee; the committee shall appoint a secretary, whose duty it shall be to keep the accounts and record all the proceedings of the society; all vacancies in the committee which may occur during the year shall be filled up by the general committee. The committee may nominate seven ladies, who shall be requested to act as visitors to the girls' school.

" 7th. The committee shall meet on the first Monday in every quarter, for the transaction of general business; three being a quorum.

" 8th. The system of teaching shall be left to the master and mistress of each school; in case any contributor shall consider that he has cause of complaint against the teacher, he shall bring such complaint before the committee, at the next quarterly meeting, when such complaint shall be taken into immediate consideration. A meeting of the committee may be called at any time for special business, at the request, made in writing, addressed to the secretary, stating the object of the meeting, and signed by seven contributors. The secretary shall give three clear days' notice (Sundays excepted) of every meeting of the committee, by placing a written notice on the door of the school.

" 9th. Any of the scholars misconducting themselves, shall be denied the privilege of attending the school for such period as the committee may think fit.

" 10th. The children of any deceased contributor shall be entitled to all the benefits of the schools during the pleasure of the committee.

" 11th. The vacations shall be as under, viz.:—

Two weeks at Christmas;
One week at Easter;
Three weeks in summer or autumn.

The days on which the vacations are to commence shall be fixed by the committee and the teachers.

" 12th. A meeting of the contributors shall be held at the end of each year for receiving the report of the committee and examining the accounts. Notice of such meeting to be given by the secretary."

Number of Collieries.

According to Sir George Grey's circular of the 16th February, I find that the number of collieries in my district are as follows, including both the Leasale and Small Landsale Collieries, &c.

North Durham - - - -	75
Northumberland - - - -	55
Cumberland - - - - -	30
Total - -	160

As there is only one case of explosion to record, that at Seghill; I think it well to enclose the proceedings at the coroner's inquest on the 16th of September, as follows:

THE FATAL COLLIERY EXPLOSION AT SEGHILL.

THE ADJOURNED INQUEST ON THE BODIES.

The inquest on the bodies of the six men and the boy who lost their lives by the explosion in Seghill Colliery, about 11 o'clock on the evening of Wednesday week, which was adjourned from the 9th instant, was resumed yesterday, before Mr. Cockcroft, deputy coroner, in the Hope and Anchor public house, Seghill. The room was crowded during the inquiry, and among those present we observed Mr. M. Dunn, inspector of mines; Joseph Laycock, Esquire, owner of the colliery in which the explosion took place; Mr. Forster, consulting engineer to the coal trade; the Revs. W. Skeene and J. Brown; Dr. Davison; Dr. Pyle, Earsdon; Mr. T. G. Hurst, mining engineer; and Messrs. Catron, Nicholson, and Maddison, viewers, &c.

Jonathan Campbell, who was the first witness examined on his oath, said as follows: I live at Seghill, and am a master shifter in Seghill Colliery. My duties are to examine the pit at night, and see if everything is all right. I examine the whole pit every night, unless something in the pit prevents me from examining the whole of it. I had made an examination of the pit about half past seven o'clock on the night that the explosion happened. I was in that part of the workings where the explosion took place. Two hewers and a boy were working there. The two men were killed. Their names were Heaps and Whitehouse. At this part of the pit they work with lamps. It will be about 150 yards from that part of the pit were naked lamps are used. We call the part of the pit where the explosion happened the " Old Flat." The explosion happened near to eleven o'clock at night, fully four hours after I had been there. Both Heaps and Whitehead had their lamps. William Taylor was the boy's name, and he likewise had a lamp. These lamps are locked. The deputies locked them. I think William Thompson locked these lamps. He is here to-day. I have been near 38 years in the colliery. I know the ventilation of it. The ventilation, as far as

I could see, was very good that night. There is a caution board placed there about the lights. I tried the ventilation by a scale on a door. There seemed to be a good deal of air at the time. The air would go down to where the men were working. The scale would be about 10 inches or a foot square. There is a hole in the door to show what quantity of air is in the pit. I have never found any gas about that place. There is a goaf near to the place, which is about 3½ acres in extent. I sent some men to get the place made ready for the next shift. The rules with regard to lamps are printed and put up. All the lamps have been found. One man, Robinson, was allowed a key, for fear the lamps should go out. It is a rule that if a lamp should go out it should not be lighted at that place. I have heard none of the men complaining as to gas being in that part of the pit, or as to its being unsafe. I have examined the place. There has been a fall, but I cannot say when it took place. The pit is not subject to blowers. Smoking is not allowed in the pit. I was in the yard seam when the explosion took place. After the explosion I went into the low seam. I was unable to get within 500 yards of where the explosion happened. Mr. Sanderson and I found Jackson and Mills. They were found in the Californian way. They were not burned. I think Mills would be about 16. I think, perhaps, that something had struck them. They had been leading timber. They had a pony which was beside them. The pony was dead. That was a place where they could have worked with naked lights. I did not find any of the other bodies. There is a penalty for opening the lamps. The rule against smoking has been enforced sometimes. Robinson, who was entrusted with a key, was a shifter; and he has been working in the pit for a long time. The lamps cannot be opened without a key.

By Mr. Dunn: I cannot say where the explosion originated; neither can I account for it all. Robinson's lamp was found open. The brick stoppings were blown out about 600 yards. There might be some stowing about the stoppings. It would be about one o'clock when I got to the cross-cut way. It would perhaps be eight o'clock on Thursday morning when I got to the Californian way.

Bobert Barras said: I am master wasteman in Seghill Colliery. I have been there for about 35 years. I have been a wasteman 20 years. My duties are to attend to the return air waste to see that all is right. On Wednesday morning I was up the Californian way, and round by the old flat. I never saw the air in a nicer state than it was that morning. I tested it with my lamp. Previous to the explosion I had never found any indications of gas in the place. I have never seen any gas in the goaf. I cannot form any idea what originated the explosion. I have had no complaints from any of the workmen within the last few months. I think there must have been a naked lamp used somewhere. We keep barometers in the pit. On Wednesday morning one of the barometers was, I think, 29·90. The safety lamps were used because of the place's vicinity to the goaf. I have seen no gas come from the goaf for a very long time now. I have nothing to do with the department for attending to the lamps. There is no powder used now.

By Mr. Dunn: The open light is kept near the caution board. I cannot think where the naked lamp had been. I was not present when any of the bodies were found.

John Greenwell said: I am a deputy in the yard seam of Seghill pit. My duty is to go round that portion of the pit every morning and see if there is any gas. I went into the pit on Friday night, at eight o'clock. I found a lamp, which was closed. The top of the lamp was separated from the rest of it. I found it near the Moor House way. I found it about eight yards from where the naked light was. The lamp belonged to William Taylor, putter. His body was found a long distance further in than the lamp. I have been in the pit for four months.

George Coltart was the next witness called.—He said: I am a back overman in Seghill pit. I know nothing about the workings of the low seam. I went into the low seam at six o'clock on Thursday morning. I got to the place where the living men were. I took up the top of the lamp which Greenwell found. I found none of the dead men.

Wm. Bowman, back overman, said: I live at Seghill. My duty is to see that all is kept right in the low seam. I had been through the place at eleven o'clock on the morning of the day when the explosion happened. I examined all round where I was, and saw that the air was coming in in its usual way. I tried for gas with my lamp, but found none. I never found any gas at that place. I have been back overman for four years. I can't say how the explosion happened. I thought that if any place was safe, it was safe. I examined the boy, Taylor's, lamp, when he went in that night. It was all right. I locked it myself. I don't think they can open the lamps without a key. If a lamp got injured, and a little gas came out at the same time, there would be an explosion. My opinion is, that the explosion happened in one of the places where the men were working.

By Mr. Dunn: The scale in the door was blown away. The explosion could not happen without a naked light.

William Lumsden, fore-overman in the low main seam, said: I had not been through the workings on the day of the explosion. I was in them the day before, when I met the deputy, and he said that all was right. The air seemed to be very good on Tuesday. There would be a good pressure of air against the door on which the scale was. I went down at one o'clock on Thursday morning, but we had to come back. We met a great deal of choke damp. After we had got some stoppings up we went in again and found two bodies near the Moor House way. I don't know who they were. One of them had his jacket on. We went in further and found others; one of whom, I think, was Robinson. Their work was done at the time of the explosion. Their tubs were filled. We found two lamps, one of which was unlocked. It was Robinson's lamp. He had a key, because he superintended some of the men. He had to lock his lamp as well as the other men's. Another lamp was found unlocked. Robinson's was a Davy lamp. I think that some gas must have come from a fall in the goaf. I see no other cause for the explosion. There must have been a naked light to have caused the explosion. I don't think the gas could have "backed" itself to where our naked light was, because of the strong current of air. The door was put in as a regulator. There was a jacket found to the west of the bodies, with some tobacco in one of the pockets. We have not found any pipes. I think there must have been something wrong with one of the lamps. We use more of the Stephenson than of the Davy lamps. The hewers use the Stephenson lamps, and the pony drivers use the Davy lamps. One of the boys and the pony was coming out with the last tub when the explosion took place. I have never had any complaints from the men about the place.

By the foreman of the jury: I have been in the colliery over 30 years. I have been back-overman and fore-overman for eight or nine years. The door was blown partly open.

Cuthbert Gilroy said: I am a hewer in Seghill pit. I worked in the old flat before the explosion. I left it at half-past four on Wednesday afternoon. During the time I was working there on that day I observed no gas at all. I thought that it was rather warmer that day. I have been working in that place for some time. There were no props broken. I never felt it in the same way before as it was on that day. Adam Douglas and Thomas Lister were working there. We sent for the deputy. He examined the place, and saw no gas. We felt no danger of gas. We would be about 140 yards from where the naked light was standing.

Adam Douglas said he was working with the last witness at that place on last Wednesday. They thought the air was a little slack, but it was not such as to cause any uneasiness. They sent for the deputy for the stone working, not for fear of any gas. There were falls of stones where they were working. He (the witness) did not think that he could open a lamp without a key, and felt quite safe in the place.

Thomas Lister was working alongside of the two last witnesses on the day on which the explosion took place. He did not notice anything different in the air that day. In other respects, he confirmed the evidence of the two last witnesses.

Wm. Thompson said: I am deputy in the low main seam in Sedghill pit. The three last witnesses sent for me on Wednesday. I put in some timber, as they said the goaf was working. I was with them from about three until half-past four, when we all left together. I tried for gas with my lamp, but found none. I had never found gas there, nor near it, on former occasions. I think there must have been a fall in the goaf. I think one of the lamps has been injured. I think that the injury done to this lamp which is shown me (one of the lamps that was found in the pit after the explosion), has been done by a blow. If gas came near the broken part of the lamp, there would be an explosion. I examined the lamps, and know that this one was not injured in this way when the men went to their work.

By the Foreman of the Jury: I don't think the gas fired at the naked standing light. The light was a mistress lamp. I don't think the gas could go down to where the naked light was.

By Mr. Forster: If there had been gas in the goaf it would have gone by the return way and not the regulating door.

James Johnstone, fitter, said he found three of the lamps. One of the lamps (Robinson's) was open. He saw all the bodies. He first came to two bodies which were lying at the Moor House way. One was dressed and the other not, He found the three lamps at the same place. He found other three bodies further in.

By the Foreman of the Jury: The mother lamp was lying close beside where it should have been hanging.

Joseph Catron was next examined.—He said: I am the resident viewer at Seghill pit. On the 8th of August, 21,652 cubic feet of air passed along the main way per minute. The quantity that passed through the scale in the low main seam per minute was 4,002 feet, and throughout the Californian way 8,000 feet. We measured it with gunpowder smoke. I have every reason to believe that the same quantity of air was in the pit at the time of the explosion. We have not been troubled with gas at the goaf. 4,002 cubic feet of air is a proper quantity for the low main seam. We keep barometers in the pit. It is a rule in the coal trade to work all boring with safety lamps. I had been through that part of the workings on the 2d September last. I examined them carefully, and all appeared in good working order. I have seen the place since the explosion. I think it happened in the north-west judd. I think the goaf working has pressed the gas out, which has come into contact with the injured lamp. At the north-west judd there had been a fall, but I could not say whether it had been before or after the explosion. I think the fall had injured the lamp. I have never had any complaints of gas in this place. I think that the gas had fired at one of the hewers' lamps. There was nothing to indicate that the explosion happened at the naked light. I have seen a lamp injured by a fall of stone.

Thomas Forster, viewer, said—I was in the low main seam about the middle of August. We took particular notice of the ventilation. I was near the place where the explosion happened, but I think I was not in it. I said to Mr. Catron that he had an excellent current of air. The measurements I made in the pit the day before yesterday were in the main seam 28,800 cubic feet of air per minute; in the cross cut 15,750; and going down the Californian way 13,050. I believe that the explosion happened in the north-west judd. I think there must have been an uneasiness in the goaf, and probably a fall of stone, which has forced a little gas out, which gas has come into contact with a naked light, and hence the explosion. We made an experiment with the injured lamp which has been produced to-day, this morning, at a gas pipe, and found that it explodes. I believe with Mr. Catron that the lamp was injured by a fall. I don't think that the gas could have come down to the fixed naked light.

By the Foreman of the Jury: Of course it is unsafe to use a naked light in close proximity to the goaf; but 140 yards distance is considerable. I think some of the men had got some distance before they were overpowered.

By Mr. Dunn: The quantity of air passing through the new cross cut per minute was 9,650 cubic feet.

A prop was shown which was very much burned, and which was taken from the north-west judd after the explosion in which place Mr. Cartron believed the explosion took place.

The Deputy Coroner then addressed the Jury at considerable length: He was glad that they had paid so much attention to the evidence. The first question they had to decide upon was what had caused the death of those unfortunate men; and on that point they could have no doubt whatever. The next and most important question for them to consider was what had caused that explosion. He thought they would believe, after what they had heard, that the explosion happened, in the north-west judd. The gas had evidently got pressed out, and the next matter was—How had it got ignited? On that point, they could not have definite and satisfactory information. because all those persons who were there at the time had lost their lives. But he thought that the opinion of the resident viewer and Mr. Forster, that it had been ignited by the light of the injured lamp, was the most satisfactory way for explaining the matter. There did not seem to be any likelihood that the gas was ignited by going down to the stationary naked light. If they should be of that opinion their duty was very simple. The injured lamp had been tested, and sufficient opening was found in it to allow the passage of fire which ignited the gas. If, however, they thought there had been negligence on the part of any of those whose duties where to look after the state of the pit and the safety of the men, they would have to give a verdict accordingly

The jury retired and returned into the room in a short time, when the Foreman of the Jury said: We find that George Jackson and the others have been killed by an explosion of gas in the low seam of Seghill Colliery; and that such explosion was caused by the gas coming in contact with the injured lamp, and that they have been accidentally killed.

In concluding this my Report, I beg respectfully to remark, as to my general practice in visiting the various mines in my district, since the commencement of the Inspection Act in 1850, I have invariably and carefully scrutinized the plans and noted detailed answers to inquiries upon them, recording them in permanent books, so that from these records I obtain a general knowledge of the effects of each arrangement, and also of the quantities of air, its nature and velocity, as well as the principles and practice at the different collieries (as explained in my weekly summaries), so that when visiting a mine or inquiring if there is anything requiring an underground inspection, and neither masters nor men request advice or opinion, underground inspection is to a certain degree unnecessary.

The General Report for 1864 shows a remarkable absence of explosions, with the exception of Seghill, before-mentioned. I have never during the year had more than two specific calls, and those calls were disputes between masters and men, for this district has been especially free from sudden gusts of gas, which so largely abounds in other districts.

After the explosion in the year 1862, I succeeded in making an arrangement with the men at Burradon, with the sanction of the masters, that two miners, to be changed every month, should examine the air courses and other important points of danger, and to immediately communicate with the manager of the mine and the inspector as to any point requiring attention. This arrangement has been steadily adhered to ever since, and I am glad to state that it has answered an exceeding good purpose, which has induced a similar recommendation to other managers of mines. In conclusion, I may observe, that on examination of the list of casualties, it will be remarked that they are so isolated that it is difficult to discover a case in which the actual interference of the inspector could have been productive of a practical good effect. Upon the whole, I submit that it may be said with perfect correctness that generally the application of the Inspection Act has effected much good in bringing about a safe and more scientific system of working and ventilating mines, and that the true principles of doing so are much better understood than formerly, and are getting more and more impressed amongst the managers of mines and those employed in them.

The Act of Parliament regarding second shafts is being carried out at those collieries which were found defective in that respect, viz., Coanwood, North Seaton, Somerstone, Acomb, Backworth, Coxledge and Fawdon, Fenham, Sheriff Hill, Grey Southen, Bolton, Framlington, Charlotte Pit, Townley.

The incalculable advantages to be derived from the extraordinary addition to the powers of ventilation for the future must be obvious to all; thus showing the great utility of the Act of Parliament of 1862.

MATTHIAS DUNN,
Inspector.

Mr. Atkinson's Report.

REPORT on the INSPECTION of MINES in the SOUTH DURHAM MINES INSPECTION DISTRICT, from the 31st December 1863 to the 31st December 1864.— By JOHN J. ATKINSON, Esq.

SIR, Chilton Moor, Fence Houses, February 28, 1865.

As Inspector of Mines for the South Durham District, I have the honour to report to you, with reference to the year ended 31st December 1864, as follows:—

The following Table shows the number of fatal accidents of different kinds, and the number of deaths that have resulted from them, in the coal mines of the district, in each of the years 1860, 1861, 1862, 1863, and 1864; the last being the year embraced by this Report.

	Number of Separate Accidents.					Number of Deaths resulting.				
	Year.					Year.				
———	1860.	1861.	1862.	1863.	1864.	1860.	1861.	1862.	1863.	1864.
EXPLOSIONS OF FIRE-DAMP -	4	1	2	1	2	26	1	2	1	3
FALLS OF COAL AND STONE.										
Falls of coal - - - - -	2	3	2	5	–	2	3	4	5	–
Falls of stone - - - - -	28	27	16	35	30	28	27	16	35	30
Total falls in mine -	30	30	18	40	30	30	30	20	40	30
IN SHAFTS.										
Overwinding - - - - -	–	–	1	–	–	–	–	1	–	–
Ropes or chains breaking - -	–	–	–	1	–	–	–	–	2	–
Whilst ascending or descending -	3	3	–	3	–	3	4	–	6	–
Falling into shaft from top - -	1	–	–	1	3	1	–	–	1	3
Things falling from top of shaft -	–	–	–	–	2	–	–	–	–	2
Falling from part way down -	2	3	3	1	5	2	3	3	4	6
Things falling from part way down	–	–	–	–	–	–	–	–	–	–
Sundries in shafts - - -	4	3	–	1	5	4	3	–	1	5
Totals in shafts - -	10	9	4	7	15	10	10	4	14	16
MISCELLANEOUS UNDERGROUND.										
Explosions of gunpowder - -	–	1	–	–	–	–	1	–	–	–
Suffocation by gases - - -	–	–	–	–	–	–	–	–	–	–
Irruptions of water - - -	–	–	–	–	–	–	–	–	–	–
Falling into water - - -	–	–	1	–	–	–	–	1	–	–
On incline and engine planes -	6	5	6	9	5	6	5	6	9	5
By trams or tubs underground -	10	14	14	11	16	10	14	14	11	16
By machinery do. - -	–	–	–	–	2	–	–	–	–	2
Sundries underground - -	–	–	2	–	1	–	–	2	–	1
Total miscellaneous underground	16	20	23	20	24	16	20	23	20	24
Total underground - - -	60	60	47	68	71	82	61	49	75	73
ON SURFACE.										
By machinery on surface - -	3	2	1	3	3	3	2	1	3	3
By boilers bursting on surface -	–	–	–	–	2	–	–	–	–	6
By sundries on surface - -	4	13	6	10	7	4	13	6	10	7
Total on surface - -	7	15	7	13	12	7	15	7	13	16
GROSS TOTALS -	67	75	54	81	83	89	76	56	88	89

Ironstone mines.

There are very few ironstone mines under the operation of the Inspection Act in the district, and no fatal accidents have taken place in them during the past year.

Explosions of fire-damp.

On examining the preceding table, which relates only to the coal mines of the district, it may be observed that there have been two fatal accidents from explosions of fire-damp, one of which caused the deaths of two persons, and the other the death of one person only.

Falls of coal and stone.

The fatalities resulting from falls of stone in the mines have been about the same as the average number for a few years past.

Shaft accidents.

The deaths resulting from accidents in shafts have been unusually numerous during the past year, amounting to 16, compared with an average of only 9½ during the preceding four years.

Miscellaneous underground accidents.

The fatalities from miscellaneous accidents in the mines, consisting chiefly of crushes by coal tubs, have been rather more numerous than usual during the past year.

Total accidents underground.

On the whole the number of deaths from underground accidents have been rather more during the past year than they have been on the average of the preceding four years, as exhibited in the Table.

Surface accidents.

The deaths from accidents on the surface have also been more numerous during the past year than on the average of the preceding four years embraced by the Table, chiefly in consequence of two boiler explosions, each causing the deaths of three persons.

Comparative numbers of accidents and deaths.

Although the deaths resulting from accidents in and about the collieries of the district have, upon the whole, been rather more numerous during the past year than on the average of the preceding four years, there has been no more extensively fatal accident than the two boiler explosions, each causing the deaths of three persons; a shaft accident, and an explosion of fire damp, each proved fatal to two persons; while the remaining 79 accidents, each proved fatal to a single person only.

A detailed list of the fatal accidents that have occurred in and about the collieries of the district during the past year, 1864, is appended to this report.

New summary, comparing the numbers of persons employed, the accidents, and the deaths in the different inspection districts.

Prefixed to this report is a summary showing the number of persons employed in and about the coal mines, the quantity of coal raised, and the number and the proportion of fatal accidents, and of lives lost in and about the mines, in each of the twelve inspection districts into which the kingdom is divided.

It may be seen, by this summary, that the South Durham inspection district stands favourably in comparison with the general average of the entire kingdom.

The summary shows that in the year 1864 one fatal accident took place for every 395 persons employed, and resulted in the death of one person for every 354 persons employed in and about all the coal mines of Great Britain; while in the South Durham inspection district, during the same year, there was one fatal accident only for every 399 persons employed, resulting in the death of one person only for every 372 persons employed in and about the mines of the district.

The summary also shows that in the year 1864 one fatal accident took place for every 122,423 tons of coal raised, and resulted in the death of one person for every 109,715 tons raised at the whole of the coal mines of Great Britain; while, in the South Durham inspection district only one fatal accident took place for every 166,693 tons of coal raised, and resulted in the death of only one person for every 155,456 tons raised.

The computed number of persons employed in and about the coal mines of Great Britain in the year 1864 amounts to 307,542 of which number 33,115 are computed as having been so employed in and about the mines in the South Durham inspection district.

The computed quantity of coal raised from the whole of the mines in Great Britain, during the year 1864, amounts to 95,122,919 tons, of which quantity 13,835,544 tons are computed to have been obtained from the mines of the South Durham inspection district.

Through the courtesy of the owners and managers of the mines of this district I have obtained written returns of the quantities of coal raised at nearly the whole of the mines, the quantities which I have had to estimate, in the absence of such returns, forming less than four per cent. of the total quantity stated in the summary; so that it seems improbable that the real and computed quantities, so far as regards this district, will differ so much as one per cent.

The number of persons employed in and about the mines of the district in 1861 have been obtained from the Census tables of 1861, so far as they show them; but, owing to the boundaries of the census districts not coinciding in some instances with the boundary of the inspection district, and to the fact of the census minor district *divisions* only embracing persons above 20 years of age, as well as to changes having taken place in several respects since 1861, the number stated in the summary as employed in 1864 can only be regarded as being a close approximation to the actual number then employed.

Fatal explosions of fire-damp.

No. 15 accident. At Seaton Colliery, belonging to the late Marchioness of Londonderry, on the 6th of April, a slight explosion of fire-damp occurred, unfortunately scorching four persons who were employed at the place where it happened, two of whom ultimately died from its effects.

Preparations were in progress for forming a very large arched flue (with side ways) for conducting the return air of the Seaham Colliery to the Seaton Colliery shaft, in and above the main coal seam; a considerable quantity of the brick arching had been put in, and a large excavation was being cleared in front of it for the purpose of extending the arching; immediately beyond the arching there was a fault or hitch, and the roof had fallen to a great height above the level of the top of the arching, and while the workmen were engaged in removing the *débris* a fall of stone took place, which was immediately followed by the fatal explosion of fire-damp. One of the persons burnt by the explosion, and who ultimately died from the injuries caused by it, was the person in immediate charge of the operations.

The evidence at the inquest on William Fairly, who also died from the effects of this explosion, went to show that a large fall of stone immediately preceded the explosion. That no gas had been observed in the place before it took place, and that naked lights were used. It was necessary to fire shots, but gas was searched for, with safety lamps, before a shot was fired. There was a ventilation of about 5,000 cubic feet of air per minute in the place, which was only about 150 yards from the shaft of Seaton Colliery. A naked light was said to have been used in the upper part of the place about two hours before the explosion took place, without any symptoms of the presence of gas having been observed. The underviewer stated that he had a naked light in the upper part of the place for about three hours on the morning of the day when the accident happened, and that he then saw no symptoms of the presence of gas, nor had he observed any such symptoms at any previous time. He stated further, that he went and examined the place after the explosion occurred, and found no indications of the presence of gas.

From the evidence it seemed probable that the gas had either been liberated from the fault or hitch, by the fall of stone, or that it had accumulated in the upper part of the place, and had been forced down upon the workmen's naked lights by the fall of stone. The jury returned a verdict of accidental death.

Safety lamps were adopted for working the place after the occurrence of the explosion.

No. 23 accident. On the 23d of April, at Thornley Colliery, belonging to the Thornley Coal Company, a small quantity of fire-damp exploded and caused the death of James Laughren, a coal hewer, 30 years of age.

The evidence given at the inquest in this case appeared to indicate that a small quantity of gas had been observed in the face of the place where the explosion occurred, early in the morning of the day when it took place, and before the fore-shift hewer commenced to work in it; and that the deputy overman, instead of clearing away the gas by bratticing the place, or refraining from employing a hewer in it, had resorted to the primitive and generally abandoned practice of dashing the atmosphere of the place, until the small quantity of gas was so diluted with air as to render it inexplosive, and so far, harmless. After this the deputy had set the fore-shift hewer to work in the place with a safety lamp; and, after a certain time, had taken the safety lamp from him and allowed him to work the place with a naked light. The fore-shift hewer had been out of the place where he was working for some time previous to the arrival of the back-shift hewer, who had to succeed him. On the back-shift hewer afterwards reaching the face of the place a small quantity of gas, which had accumulated during the previous temporary absence of his predecessor, exploded at his light, and burnt him.

The fore-shift deputy was censured by the jury; and at my instance, both the fore-shift and the back-shift deputies were discharged from their offices; the former on account of a want of due care, and the latter because of the incompetence betrayed by his statements at the inquest.

Since the accident, more strict orders have been given to all the deputy overmen of the colliery, that no places exhibiting indications of the presence of gas, when examined by them, are to be set to work until after the gas has been removed by bratticing or other proper means; and that in no case has the practice of dashing gas to be resorted to.

Non-fatal explosions of gas.

Besides the two explosions of gas just described as having proved fatal to three persons, there have been four other slight explosions of gas in the mines of the district, during the past year, each of which has caused more or less personal injury to one person.

One of these explosions took place at Newton Cap Colliery, by which a stoneman was slightly burnt; a second at Sherburn House Colliery, by which a deputy overman was burnt; a third at Newbottle Colliery, while the coal was on fire there, by which a person who was employed in trying to extinguish it, was burnt; and a fourth in the Nicholson's pit of Rainton Colliery, by which a workman was burnt.

The non-fatal explosion at Newbottle Colliery arose through two workmen unexpectedly opening a communication between the Margaret pit workings and the Jane pit workings at that colliery on the 8th of April, the latter pit having been abandoned for about 60 years, and the shaft closed up after an explosion; on opening the communication gas came out of the old workings with considerable force, and the workmen ran away from the place, leaving their safety lamps behind. Very soon after this, a slight explosion took place at one of the lamps, and the coal was set on fire by it, and that part of the workings had to be closed off for some time, in order to extinguish the fire. When the fire was extinguished and the place was again reached, strange to relate, both the safety lamps were found to be in good order. They were common Davy lamps.

Cases of gas being exploded by safety-lamps in good order.

This is a second well authenticated case of gas having been exploded at safety lamps in proper order, in this coal field, the other case having occurred at Monkwearmouth Colliery.

Falls of coal and stone.

The number of deaths caused by falls of coal and stone in the mines of the district during the past year, have amounted to the average number per year, for a few years past.

The avocations of the persons to whom this class of accidents has proved fatal during the past year, were as follow:—

	Number of Deaths.
Coal hewers	11
Deputy overmen	11
Putters	4
Stoneman	1
Platelayer	1
Fire-clay worker	1
Mason	1
Total	30

Large proportion of deputy overmen killed by falls of stone.

In former reports I have frequently remarked upon the great number of deputy overmen whose deaths are caused by falls of stone in the mines, in proportion to the number of this class of workmen that are employed; but during the past year, the excess of mortality amongst them in comparison with that amongst all other classes of workpeople, from this particular class of accidents, has, I think, been greater than I have known it in any former year.

There are probably twelve times as many coal hewers employed as there are deputy overmen, and yet the deaths from falls of stone and coal have been as numerous amongst the latter as amongst the former class, and this, notwithstanding the fact that the deputies are selected and appointed to set the timber that may be deemed necessary for the protection of the hewers, putters, and other workpeople, against accidents of this class.

The occupation of deputy overman in this district is perhaps attended with more danger to life than any other mining occupation whatever.

The operation of drawing or removing timber from places where the coal has been worked is undoubtedly of a most hazardous nature, requiring the utmost care and watchfulness on the part of the deputy overman while performing it, and it is in the course of performing this dangerous part of their duty that most of the fatal accidents occur to them.

Deputy overmen should not forget that their own personal safety is almost entirely under their own care, and they are reasonably bound to avoid incurring risks, which it would be their duty to protect other classes of workmen against incurring, under similar circumstances.

In drawing timber out of abandoned places, they should most carefully prop a way out, to prevent their being caught by falls of stone; and they should firmly make up their minds to allow timber to remain and perish, rather than unduly risk their own safety.

I consider it injudicious to pay deputy overmen for drawing timber by the number of props they succeed in obtaining from an abandoned place, as such a course holds out a temptation to them to incur an undue amount of risk in their endeavours to rescue the largest quantity, and has sometimes, probably, led to the sacrifice of their lives in the attempt.

Shaft accidents.

No. 18 accident. At Shildon Lodge Colliery, belonging to Messrs. Bolckow and Vaughan, on the 23rd of April, five workmen were being lowered down a shaft (recently sunk, to comply with the requirements of the Act 25 & 26 Vict. c. 79) upon a cradle suspended by two distinct ropes, when, owing to the canting and jerking of the cradle, two of the workmen slipped off it, and fell to the bottom of the shaft, a depth of about 50 fathoms, and were killed.

When a cradle is being lowered, while suspended by two different ropes, it is difficult to keep the cradle (which is a mere platform) in a horizontal position, owing to the ropes not being given off at equal rates; and hence the cradle is very apt to get into an inclined position, and, without great care, the persons upon it are likely to slip off and fall down the shaft.

I consider that it was a dangerous and improper thing to lower so many as five workmen from the surface under such circumstances, and that only one, or at most two, careful men should have been upon the cradle to guide it, and call to the surface as to which of the ropes required lowering or stopping from time to time, if it were not practicable to send the cradle down to near the position where it was required without any person upon it. The workmen could have been sent down to the cradle after it was lowered by a distinct rope.

With great care on the part of the workmen upon the descending cradle the accident need not have occurred; but it is best not to place workmen in such positions as require extraordinary care on their parts to save themselves from injury or loss of life in all cases where doing so can be avoided.

In this case I am inclined to think that the side of the cradle to which one of the ropes was attached had first rested upon a small projection from the side of the shaft, and had thus been arrested in its descent, while a considerable quantity of rope belonging to that side of the cradle had been slacked out, and the side of the cradle to which the other rope was attached, being free, had descended, so as to throw the cradle into an inclined position; after this, I think the arrested side of the cradle, where the slack rope had accumulated, had slipped off the projection and fallen suddenly, so as to tighten the slack rope (which, probably, admitted of that side of the cradle suddenly falling, even to a lower level than the other side), and that the two workmen had slipped off the cradle from the sudden jerk and the altered inclination of the cradle.

No. 31 accident. At Dryburn Grange Colliery, belonging to the late Marchioness of Londonderry, on the 10th of June, George Cole, an onsetter, employed at the bottom of the shaft, was killed by a cage descending upon and crushing him.

It was supposed that he had ventured into the place upon which one of the cages rested when at the bottom of the shaft, in order to repair or replace a bunting which supported the cage, and that the cage had descended upon him before he left the place.

He had been previously checked for going into the shaft bottom without first signalling to have the cages stopped from running in the shaft, as ought always to be done in such cases.

No. 33 accident. At the Wooley sinking pit, belonging to Messrs. Joseph Pease & Co., on the 16th June, Robert Walton, a sinker, was killed by a stone falling down the shaft and striking him upon the head while he was working in the bottom of the shaft.

It was a small stone, which had apparently come off the side of the shaft, but from what part of the shaft could not be ascertained, although the shaft was examined immediately after the accident with the view of ascertaining this.

No. 37 accident. At the Stanley pit, also belonging to Messrs. Joseph Pease & Co., on the 4th of July, John Thompson, a joiner at Stanley Colliery, while assisting his son, the engineer of the colliery, in removing a water tub from a cage at the top of shaft, by some mischance fell down the shaft and was killed.

He had probably been dazzled by the light of the lamps, and had not observed that he was stepping into the shaft, which necessarily had the guards removed for the purpose of taking the water tub out of the cage at the time of the accident.

No. 38 accident. At the Wooley sinking pit, belonging to Messrs. Joseph Pease & Co. (where No. 33 accident had occurred). On the 13th of July, Robert Mason, one of the chargemen over the sinkers, and brother of the contractor for sinking the pit, was killed by the explosion of a shot used for blasting the stone in sinking the shaft.

He had applied a light to ignite the shot, and had been drawn up the shaft with one of the sinkers, as usual, to be out of the way when the explosion took place.

After being suspended in the shaft he gave a signal to be lowered down to the bottom again, and persisted in landing there, notwithstanding that the light was still burning near the shot.

Immediately after landing the shot was ignited by the burning match, and the explosion ensued, causing his death, while the sinker who accompanied him escaped almost unhurt.

It was a very daring and imprudent thing on the part of Mason to venture to the bottom of the shaft when he knew that the match was still burning.

No. 42 accident. At Shotton Colliery, belonging to the Haswell Coal Company, on the 19th of July, a boy about 13 years of age fell down a staple 12 fathoms in depth and was killed. This boy, contrary to orders, was attempting to descend the staple by a ladder, instead of waiting to be sent down in a cage. He had been forbidden to go by the ladder, and had even been chastised by one of the underground agents for having done so only on the day before the accident.

No. 47 accident. At the Jane pit of Eppleton Colliery, belonging to the Hetton Coal Company, on the 30th July, a hewer fell from the main coal seam to the bottom of the shaft, a depth of about 40 fathoms, and was killed.

In this case there were several workpeople waiting close to the shaft, at the upper or main coal seam, ready to get into a cage, to ascend the shaft on the first opportunity; some of them got into a cage, and after the usual signal was given, it was drawn away with them, the deceased and others being left waiting for the next cage; but almost immediately after the cage was drawn away the deceased fell into the shaft, and was killed. It is not known how he happened to fall into the shaft, he might have been pushed in by the crowding of the other workpeople, or he might have stepped into the shaft of his own accord, in mistake.

There were gates to prevent persons walking into the shaft by mistake, but several people were within the gates at the time of the accident, ready to go up the shaft.

No. 52 accident. At Houghton pit, belonging to the Earl of Durham, on the 5th of August, a shaft man was crushed by the cage descending upon him, while he was engaged in repairing the guides at the bottom of the shaft. The evidence given at the inquest tended to show that the accident had arisen from some mistake as to the signals, either on the part of deceased or that of the brakesman.

I recommended that a special code of signals should in future be adopted for shaft work.

No. 57 accident. At Coxhoe Colliery, belonging to the West Hartlepool Harbour and Railway Company on the 6th of September, a boy lost his life by falling into the sump at the bottom of the shaft. It appears that the scaffold usually covering the sump had been partially removed for the purpose of putting in some pipes, and that the boy, a woodleader, 16 years of age, although warned to keep off the hole, had probably gone to it, and while looking down, out of curiosity, had overbalanced himself, and fallen through the opening into the sump below.

No. 58 accident. At Waldridge Colliery, belonging to Owen Wallis & Co., on the 24th of September, William Toward, the colliery enginewright, lost his life by falling a distance of 14 fathoms, from a scaffold in the pumping shaft, where he was engaged in repairing some water boxes.

His two fellow workmen were about 4 fathoms below him when he fell, and did not see how the accident occurred, but it would appear that he had, by some means, missed his footing while he had not been holding by his hands, and so had fallen.

No. 66 accident. At Frankland Colliery, belonging to the Earl of Durham, on the 19th of October, a shift workman, who ascended a shaft which he ought not to have come up (the coal shaft being his proper route), had also refused to use a loop in ascending, as he was requested to do by his partner, and in attempting to get off the chain, at the surface, he fell into and down the shaft and was killed.

No. 68 accident.

At Houghton pit, belonging to the Earl of Durham, on the 29th of October, a shifter was killed in the shaft by a prop falling down the shaft upon him. He, with some other workmen, was engaged in getting a large balk of timber up the shaft, from the Hutton to the main coal seam; and, for the purpose, had got it slung underneath the cage, after which the deceased got upon the top of the cage, instead of getting into it, to go up the shaft to the main coal seam. After this, and while the cage was stationery, for the purpose of steadying the balk, a prop fell down the shaft, hit the man, and killed him.

As two workmen were engaged in loading a cage with props at the top of the shaft, at the time of the accident, it seems probable that they had been the cause of the prop falling down the shaft, but they said that they did not know of a prop having fallen. A hole was discovered in the fence at the top of the shaft, through which a prop, if disturbed by the removal of other props in the same heap, might have slipped into the shaft without the men being aware of its doing so.

No. 69 accident.

At Adelaide Colliery, belonging to Messrs. Joseph Pease & Co., on the 31st of October, a sinker, while being drawn up a shaft (in course of being sunk to comply with the requirements of the Act 25 & 26 Vict. cap. 79) to be out of the way of two shots that were to be exploded for blasting in the bottom of the shaft, fell out of the kibble and to the bottom of the shaft, a depth of 8 fathoms, owing to the kibble striking the shaft side and a bunting; after he fell the shots exploded, and he lost his life by the accident.

No. 72 accident.

At Nettlesworth Colliery, belonging to Messrs. Johassohn and Elliot, on the 15th of November, a man was killed whilst ascending the shaft, owing to a coal tub falling down the shaft from the surface, and breaking the chains of the cage in which he was ascending, and so causing the cage, and the workmen in it, to fall to the bottom of the shaft.

This accident, although immediately brought about by carelessness on the part of two workmen, who, after emptying a tub of its coals near the top of the shaft, allowed the empty tub to run into the shaft, may nevertheless be considered as having indirectly arisen from the absence of self-acting guards at the top of the shaft, and affords a striking illustration of the desirableness of employing such guards.

Self-acting guards had been in use at the top of the shaft, until about six weeks before the accident, but, owing to the engineman having drawn the cage too high, and the guard guides not having been properly constructed, one of the guards had fallen down the shaft and had not been replaced at the time when the accident occurred, or it could not have happened.

Self-acting guards at the tops of shafts, like any other safety apparatus, if not properly constructed, may, while averting many accidents, be the cause of others; but there can be no doubt of the salutary effects of self-acting guards at the tops of shafts when properly constructed and attended to; and I should be glad to see them adopted at the top of every working shaft admitting of their application.

No. 74 accident.

At Shincliffe Colliery, on 2d December, two men got upon the top of a cage in an underground staple, to be drawn to an upper seam, the brake being attended to by a deputy overman; but, by some means (the cause I could not ascertain by the most searching enquiries), the cage appears to have been drawn up the staple at too high a speed, and the men were both injured by being struck against the pulley frame work, at the top of the staple; one of the men ultimately died from the effects of the injuries which he received.

The machinery appears to have been in good order, and the brake of ample power to command the movement of the cages. The deputy, who appeared to be much shocked at what had occurred, could give no satisfactory account of the cause of the accident, and it still remains a mystery. The workmen ought to have gone up the staple by means of ladders fixed in it for the purpose.

Precautions suggested by the foregoing shaft accidents.

Cradles ought not to be used for Persons to descend or ascend shafts.

No. 18 accident shows that to use a cradle or platform for descending a shaft, except over very short distances, where work is going forward, is a dangerous practice, particularly if it happens to be suspended by two independent ropes.

Suggested safeguards for the bottoms of shafts.

No. 31 accident indicates that it is a dangerous practice to go into a shaft bottom, while winding is in operation; and I am of opinion that it is well to make the bottoms of shafts as difficult of access as may be under such circumstances. This may to some extent be effected by shutting off the shaft by a horizontal bar, only high enough to allow tubs to pass underneath it; the bar to be at liberty to rise upwards, either by being placed in stirrups, or by having a joint at one end and a stirrup at the other.

The necessity for removing such a bar before going into the bottom of the shaft would make it a more troublesome and formal business to go there, and would probably lead to the signal being given to stop the winding operations in many instances in which this duty is neglected in its absence.

The mobility upwards of the bar would prevent its injuring persons brought in contact with it, by the raising of the cage while they were in the act of getting into the cage to ascend the shaft, should such a thing occur.

A distinct apparatus or code of signals for persons in shafts is recommended.

No. 52 accident shows the necessity of having very distinct, definite, and well understood signals for shafts. It is probably best to have different classes of signalling apparatus, such as a rapper and a bell, the one to be used to signal only when materials are to be drawn up the shaft, and the other to be used only when persons are to be moved in, or drawn up the shaft.

Self-acting guards for the tops of shafts are recommended.

No. 72 accident shows how desirable it is to employ self-acting guards of proper construction at the tops of shafts, to prevent persons or materials falling into the shafts.

The locking of self-acting machinery, in the absence of persons appointed to work it, is recommended.

No. 74 accident shows that all machinery of a self-acting character, the working of which by improper persons, in the absence of the person appointed to direct it, may be attended with danger to life, should be at such times securely locked to prevent its being put into operation.

Miscellaneous Underground Accidents.

The number of deaths caused by the accidents may be classified thus:—

Crushed by coal tubs in the workings and horse roads in the mines	16
Crushed by coal tubs in engine and self-acting inclined planes in the mines	6
By underground machinery	2
Total	24

Dangers arising from pony-putting.

A large proportion of the deaths from being crushed by coal tubs in the extreme workings of the mine is attributable to the very general custom of *putting* being done by small Shetland ponies, driven by boys in the low and narrow galleries of the mines in this district; the boys are often jammed between the tubs drawn by the ponies, either against the roof or the sides of the galleries, or against the timber employed to support the roof; the gentle inclination of the strata of the Newcastle coal field admitting of this mode of *putting*, while it could not very well be practised in seams having an inclination to the horizon as great as what prevails in many of the other coal fields of the kingdom.

The use of underground hauling engines attended with danger.

The extensive employment in this district of underground hauling engines, often drawing trains of tubs at high speeds along the principal thoroughfares of the mines, which are at the same time traversed by workmen on their way to and from their working places in the extreme parts of the mines, frequently (from accidentally losing their lights) in the dark over a considerable part of the distance, serves to account for many of the lives lost by being crushed by tubs in engine planes.

Some of these accidents arise from the practice of riding in or upon trains of tubs, in cases where riding is prohibited, a species of disobedience of orders which it is almost impossible to prevent. In cases where it is considered to be safe to allow workpeople to ride in trains, they are, in many instances, allowed to do so.

In others, where it is considered to be unsafe to ride, it is almost impossible entirely to prevent some of the workpeople from riding, contrary to orders.

No. 76 accident.

Of the two remaining accidents under this head, one was the case of a boy who was employed to guide a round wire rope in folding upon the drum of an underground engine, and who, by some means, got entangled with the rope, and was drawn by it upon the drum and carried around upon it until several folds of the rope were lapped upon him, from the effects of which he died.

It is probable that the crowbar that he used for guiding the rope had slipped, and that he, having lost the support afforded by it, had fallen upon the rope.

The other accident caused the death of a brakeman, through being crushed between the drum and pillar of an underground hauling engine, owing to his imprudently being engaged in oiling the bearance while a pony was in the act of starting the empty set of tubs attached to the rope, which he had just previously breaked to the foot of a self-acting incline; he had made arrangements for the pony to pull the set of tubs and rope beyond the place where the tubs had stopped.

Above ground accidents.

The deaths that have resulted from above ground accidents about the pits of the district during the past year, may be classified as follows:—

Crushed by waggons on the railway branches, near the pits	4
Falling into hot water	2
Crushed by machinery	2
Suffocated by coals in a waggon	1
Apparatus chain broke; crushed by tub	1
By two boiler explosions	6
Total	16

No. 21 accident. No. 35 accident. No. 51 accident. No. 54 accident.

Of the four deaths caused by waggons on the branch railways near the pits, one was owing to a set of waggons coming into collision with the waggons standing under the screens, and crushing one of the screen men against the screen erections; another was that of a boy, who appears to have missed his footing while attempting to get upon a set of waggons in motion, intending to ride home from his work, contrary to orders; a third was that of a boy who was struck by a drag (which he had put in the wheel of one of a set of waggons in motion), and was crushed by a wheel of one of the waggons, and died from the injuries he received; the fourth was that of a waggon rider, who was crushed by the empty waggons getting off the rails and falling over the "kip" upon him.

No. 39 accident. No. 32 accident.

The two accidents from falling into hot water arose, the one from a boy accidentally falling or walking into a hole containing the water that had been let out of a boiler recently unplugged, and receiving such scalds as caused his death; the other was the case of a fireman who went into a delivery drift for the purpose of cleaning a grating; but, unaccountably, he appears to have gone over the grating without noticing it, and to have passed on into a depth of about 18 inches of hot water coming from an engine, where he was found dead about an hour afterwards. Precaution against similar accidents in future were suggested.

No. 55 accident.

The two deaths resulting from being crushed by machinery were caused as follows:—one was the case of a boy while attempting to oil the shaft of a fly-wheel in motion (without any person being aware of his doing so, and the oiling of the shaft being no part of his duty) becoming entangled in a spur-wheel, which inflicted injuries upon him that resulted in his death.

No. 61 accident.

The other case was that of a boy who got entangled in a lying sheave, over which a rope worked; the wheel was quite out of the boy's way, had he simply attended to his duties.

No. 9 accident.

Another of the aboveground fatal accidents arose from a boy, who was employed to open a shutter to allow small coals to run into a waggon, having been suffocated by the coals in the waggon.

No. 40 accident.

Another of these accidents was the breaking of an apparatus chain, owing to which the tub run amain, and struck a boy, causing injuries which resulted in his death.

Boiler explosions.

No. 25 accident.

At Kepier Grange Colliery, near Durham, belonging to the Kepier Grange Coal Company, on the 13th of May, a boiler exploded, causing the deaths of three persons, namely:—

James Brown, a fireman	33 years of age.
John Miller, not employed	10 years of age; and
William Grainger ditto	8 years of age.

There were three boilers connected with the engine, all cylindrical in form, with hemispherical ends, and fired externally. At the time of the explosion there were only two out of the three boilers at work, the centre boiler not being in use at the time. Each of the two boilers that were at work were 32 feet in length and 6½ feet in diameter, and were connected with each other by a steam-pipe common to both.

There were two safety valves, each five inches in diameter, and two common floats as water gauges on each of the boilers.

There was a steam gauge in connexion with the boilers, and an alarm whistle to give notice when there was too little water in the boilers.

The ordinary working pressure of the steam (above atmospheric pressure) was 35 lbs. to the square inch. It was the outside boiler or that farthest from the engine which exploded.

At the inquest the evidence of the engineman went to show that the engine had, with trivial exceptions, been worked to pump water from about nine a.m. up to about half-past twelve at noon, when the explosion occurred; that he had kept a proper supply of water in the boilers; that he had been at the boilers about a quarter of an hour before the explosion took place, and then found all the valves and floats in good working order; that some trifling repairs had been made to the boiler only about ten days previously, and that it had slightly leaked since that time above the back part of the fire, but was not observed to be leaking when examined at eight a.m. and again at 10 a.m. on the day of the explosion; that the steam gauge indicated a pressure of 35 lbs. to the square inch when he last noticed it, about five minutes before the explosion took place; and that he never heard the alarm sound that morning.

Isaac Robinson, the master enginewright at the colliery, stated in his evidence that he had examined the two boilers that were at work about seven a.m. on the day of the explosion, when the fireman told him there was no leakage going on; that he himself observed none; that he found the floats and safety valves all right, and the steam gauge indicating a pressure of 35 lbs. to the square inch; this being the ordinary working pressure.

He stated, that the plates above the fire were put in in the month of June 1863, but he was unable to state where they were manufactured or obtained.

He produced some of the plate of the boiler, which was bad in quality, although nearly of its primitive thickness of three-eighths of an inch, and had only formed a part of the boiler for a short time.

Thomas Grant Thompson, the night engineman, stated, that he took charge of the engine about five p.m. on the day before the explosion occurred, and remained in charge of it till six a.m. on the morning of the day of the explosion. He stated, that there had been a slight leakage of the boiler at two rivets at about three to four a.m., but that he put some meal into the feed-water and it stopped the leakage directly; that he told his partner this when he came to the engine at six a.m. He stated, that when he left at six a.m. the safety-valves and boiler gearing were all in good order; that the engine had only been worked up to about one a.m., but that the steam had been up all through the night; that the boiler had leaked a little about two nights previous to this, but that the leakage was then stopped by meal; that he had been engineman about seven years; and that he did not think that the boiler was in a dangerous condition.

The late Mr. John Hedley, who was formerly engineer for the South Hetton, Murton, East Hetton, and Trindon Grange Collieries, had examined the exploded boiler, and gave evidence to the following effect:—Had heard the previous evidence; did not think there had been any deficiency of water, or extraordinary pressure of steam; observed that there had been a leak above the fire at the cross seam, and also a slight leak at the longitudinal seam; that the plate had been split at the rivet holes at intervals, which would render that part of the boiler which was above the fire weak; and that he had little doubt but that the boiler had burst at that longitudinal seam. The plates of the boiler all appeared to be about the usual thickness of three-eighths of an inch, except for about a square foot in area, on the top of the boiler, where it was not exposed to the fire; and that he did not think that the thin plate had had anything to do with the explosion. He found the iron of the plates, where he thought the boiler had first given way, hard and brittle along the bottom of the boiler; and the bad quality of this iron he thought had been the chief cause of the explosion; he blamed one plate in particular as the cause.

Witness did not think the amount of leakage had been serious, or the rye meal would not have stopped it. He had examined the safety-valves and feed apparatus, and found them all right; the safety-valves were more than sufficient in size; and he was of opinion that the explosion had taken place at the ordinary working pressure of about 35 lbs. to the square inch.

I had, myself, made an examination of the exploded boiler, and the apparatus connected with it, and had noticed, from the discolouration of a large area of ground, that there appeared to have been plenty of water in the boiler at the time when it exploded: and my opinion as to the cause of the explosion coincided with that expressed by Mr. Hedley in his evidence. A verdict of accidental death was returned by the coroner's jury.

At the Moorsley Pits of North Hetton Colliery, belonging to the North Hetton Coal Company, on the 30th of July, a boiler exploded, causing the death of three persons, namely:— **No. 48 accident.**

Edward Taylor, a fireman - - -	17 years of age,
William T. Palmer, do. - - -	19 do. ; and
John Wild, an infant - - - -	11 months of age.

In this case there were six cylindrical boilers, placed side by side, parallel to each other; it was the fourth boiler from the engine which exploded; there being two boilers on the outside of it and three between it and the engine.

The boiler which exploded was the shortest one of the series, being only 25 feet in length over the egg ends. It was six feet in diameter, and built of three-eight inch plates; it had two common floats as water gauges, a sludging apparatus, and two safety-valves, one five inches and the other three inches and three quarters in diameter. There was not a stop-valve on the feed pipe to prevent priming; two distinct sets of steam pipes connected the whole series of boilers that were at work, with each other; and each boiler had two safety-valves of the same dimensions as those on the boiler which exploded. Five of the boilers were at work at the time of the explosion, and through the two sets of steam pipes any sudden over-pressure of steam might have found vent at all or any of the ten safety-valves. The boilers were fed with water from the magnesian limestone (overlying the coal measures), and formed a fur on the boilers about one-sixteenth of an inch in thickness in a fortnight; they were cleaned fortnightly. The third boiler from the engine was off work.

The exploded boiler had been repaired about two or three months previous to the explosion, when it was new bottomed over the fire. It and all the other boilers were fired externally. There was a steam gauge in connection with the boilers, and 35 lbs. to the square inch was the ordinary working pressure.

At the inquest on the bodies the evidence of Robert Clerk, the engineer of the colliery, was to the effect that he examined the boiler after it was repaired in the preceding May, (by putting two new bottom plates and two new side plates of Farnley iron into it,) and then observed no indications of weakness, nor had he done so subsequently, before it exploded; that it had not leaked since it was repaired; that he found the feed apparatus all right after the explosion; the feed-water had, at the time of the explosion, been going into the boiler next to the engine; that feed-valve being open and all the others closed. Only one boiler was fed at one time.

There was a portion of the bottom of the boiler rather thin, but it was only over a small area, and the iron was of good quality there, and he did not think it had caused the explosion; he had known a boiler to be 30 years in use, and then put out of use without exploding.

He found the safety-valves appeared to have been all right at the time of the explosion. Specimens of some of the plates were shown to the witness, who stated that he considered those numbered 3, 4, 5, 6, and 7, and more particularly that numbered 3 A. (the numbers referring to others marked on a model of the boiler, which showed the boiler harness, and seams or joints, together with the lines of fracture at the explosion) were very brittle, especially in the overlap portions of the plates, along the lines of rivets; there was no brand nor maker's name on the plate marked 3 A, and he did not know where it had been obtained, nor when it was put into the boiler.

After the explosion he found no indications of over-heating; there had been no complaints about the boiler. Edward Taylor, one of the deceased firemen, who attended to the feeding of the boilers, was steady and attentive, and the engine was employed in winding coals out of the pit, its ordinary work, on the day of the explosion; and he could give no idea as to the cause of explosion.

Mr. George Hopper, an iron manufacturer, gave evidence to the effect that he had examined the exploded boiler, and thought it had given way along a longitudinal seam $1\frac{1}{2}$ plates or 3 feet from the bottom of the boiler, on the north side, next to the engine-house; the iron there was of bad quality, although not thin, the old plate seemed to be injured by firing. He observed no sign of over-heating, nor of want of water. He did not think that 35 lbs. per square inch would have burst the boiler; but was not able to understand how it could have been more. He noticed nothing to indicate neglect of repairs or otherwise.

He had known old boilers bear 30 to 35 lbs. per square inch when they were only one-eighth of an inch thick along the brickwork.

He had a boiler that was put in about 30 years ago, which he felt sure would bear 100 lbs. to the square inch. He was unable to account for the explosion, as he should have expected such a boiler to bear 100 lbs. pressure on the square inch.

John Greenhow, the master blacksmith, gave evidence to the effect, that it was little more than two months before the explosion that the boiler was repaired; that No. 5 sample of boiler plate was short and brittle, although it was only put into the boiler (over the fire) at that time; he had observed no leakage from the boiler, but thought the explosion had been caused through over-heating, from a want of water.

Edward Smailes, engineman, stated, that the steam gauge indicated a pressure of only 30 lbs. to the square inch about three or four minutes before the explosion; that he noticed Edward Taylor, the fireman who attended to the feeding of the boilers, leave the top of the exploded boiler only about two to four minutes before the explosion took place; while on the boiler he noticed him have hold of one of the floats. This witness stated that he had been in the boiler about three weeks before the explosion, and then saw no signs of weakness about it, nor had he heard of it leaking. There were alarm whistles to indicate a want of water in two of the boilers, and a third one upon the exploded boiler, but it was out of order. Neither of the whistles had sounded before the explosion.

He did not think the explosion had arisen through a want of water.

Robert Patterson Clerk, engineer, said he had had 30 years experience with boilers, and as many as 150 had been under his charge at one time. He had examined the exploded boiler, with myself, and found those plates along the long longitudinal rent to be of inferior quality; but this could not be known so long as they formed a part of the boiler, nor without breaking them.

He had nothing to find fault with in the fittings, nor did he see any indications of there having been a want of water or over-heating of the plates. He could only attribute the explosion to the bad quality of the plates along the longitudinal fracture. These plates were crystallized, and he thought they had given way with the working pressure of 35 lbs. to the square inch; but there might have been a sudden generation of steam at the time. He should have thought the boiler capable of bearing a pressure of 200 lbs. to the square inch but for that seam.

My own opinion as to the cause of the explosion, as stated at the inquest, was as follows:—“ In endeavouring to account for this boiler having exploded, I would remark, “ in the first place, that a careful examination of the exploded boiler does not lead me “ to any certain and positive conclusion, as I perceive no very decided appearances “ calculated to give any full assurance as to what has been the cause of the explosion. “ In the absence of any clear and evident cause of the explosion, I can only state what “ I consider to be the most probable cause, and in doing so, give a statement of my “ reasons for thinking it the most probable. A cylindrical boiler, apart from the “ strength given by the ends, the arrangement of the seams, and any irregularities in “ the thickness of the plates, will burst with half the pressure over any longitudinal “ section that would be required to burst it over any vertical section, and it seems “ that this boiler has burst along a longitudinal seam, in the absence of any particular “ indications to the contrary. The fact of the exploded boiler being so constructed “ that the longitudinal seams extend in unbroken straight lines adds to the probability “ that the boiler burst along a longitudinal line, inasmuch as experiments show that an “ ordinary seam when only single riveted (as this is, and as the generality of boilers “ are) has only about one-half of the strength of the solid plate, so that the weakest “ section due to the form of the boiler is weakened in all such boilers to about half the “ strength of the solid plate, by the continuous longitudinal seams, extending the entire “ length of the body of the boiler. With the exception of the continuous cross joints “ at the lines, where the egg ends are united to the body of the boiler, the cross seams “ have their lines so broken that they only lessen the strength of the boiler to a comparatively small extent in its cross or strongest section; and other things being equal, “ even this line would require about double the pressure to burst it that would be required “ to separate the boiler along a longitudinal seam. On examining the exploded boiler, I “ found a fracture extending along a longitudinal seam in an unbroken line for a distance “ of about thirteen feet, or more than two-thirds of the length of the cylindrical part of “ the boiler; and as some of the iron of the plates along this ruptured seam proved, on “ trial, to be of inferior or deteriorated quality, this fact, taken in connection with the “ weakening effects due to the continuous line of rivets, and to the natural weakness of “ longitudinal sections, leads me to suspect that this was the place where the boiler “ burst in the first instance. After any considerable fracture has been made in the “ weakest part of a boiler, the entire pressure on the plates at each side of the fracture “ is then exerted in tearing open the ends of the fracture and extending it; and as the “ resistance of plates is much less, as against such a tearing force than against a tensile “ force, it is easy to account for the rest of the fractures, in other parts of the boiler, “ from this tearing operation. The direction in which the principal portion of the “ boiler has been projected, coincides, to a considerable extent, with the direction that “ it might have been expected to follow, on the supposition that the longitudinal seam “ about three feet from the centre of the bottom of the boiler, on the north side, and

“ next to the engine-house, was the seam which first gave way; and that is the seam
“ along which the extensive fracture has taken place. The fact of the body of the
“ boiler having alighted further to the eastward than a line at right angles to this
“ suspected longitudinal seam may, perhaps, be due to the rupture having commenced
“ nearer to the back end than to the fire end of the boiler, or to the greater resistance
“ at one end than the other, offered by the steam and feed pipes, and other connections,
“ the unequal resistance of the brickwork, or even, in part, to a considerable wind that
“ would have great force upon the expanded plates, when up above the house-tops.
“ The unequal resistance of the different lines of fracture and the different moments at
“ which the ends of the boiler might separate from the body of the boiler, producing a
“ rocket action, appear to me, however, to be quite sufficient to account for this deviation,
“ as the flying mass would turn by a slight force in any direction. The idea that
“ the boiler had first burst at the longitudinal seam already described is supported by
“ the consideration that if a portion of either of the ends of the boiler had been the first to
“ give way it might naturally have been expected that the body and the other end of the
“ boiler would have been driven in the opposite endwise direction, by the reaction of the
“ steam and water escaping at the fracture, after the same manner that a rocket is driven
“ from the end where it is lighted and open. There is, however, strong evidence that the
“ longitudinal seam opened before the boiler was lifted from its seat, in the fact that the
“ adjoining boiler, on the side next to that seam was very much bulged, and driven with
“ great violence sideways against the engine-house. The foregoing considerations lead
“ me to be of opinion that the first rupture of the boiler took place along the seam
“ already described, and not at either of the ends of the boiler. The next matter as to
“ which I would remark is the consideration as to the pressure that burst the boiler, and
“ on this point I have been enabled to satisfy myself as to whether the ordinary working
“ pressure of 35 lbs. per square inch, or whether some much greater temporary
“ pressure has operated in producing the catastrophe. The exploded boiler, together
“ with each of the remaining four boilers that were at work at the time of the explosion,
“ each had two safety valves upon them of such sizes as to offer about three
“ times as much area for the escape of steam as is required to be employed on steam
“ boilers in France, by the administration of bridges and highways; and since the steam
“ in each boiler had access to all the ten safety-valves on the five boilers at work, by
“ means of two sets of steam pipes, it seems to be almost out of the question to presume
“ that any other than either the working pressure of 35 lbs. per square inch or a
“ momentary and suddenly generated pressure beyond this, could have caused the
“ explosion, and I consider that the question as to the pressure lies between one or
“ other of these suppositions. In order to arrive at a conclusion as to whether the
“ ordinary or some momentary and extraordinary pressure has caused this explosion,
“ it becomes necessary to consider the bursting pressure of boilers. According to some
“ experiments as to the resistance of boiler plates, in which two kinds of Yorkshire
“ plates, one Derbyshire plate, and two kinds of Staffordshire plates were tested, the
“ average tensile resistance of the solid plates was 22·519 tons, or 50,442 lbs., per
“ square inch of iron, in the lines of fracture. From other experiments on single
“ riveted plates (and allowing 30 per cent. for the iron punched or drilled out along
“ the line of rivet holes) the strength of single riveted plates, along the line of rivet
“ holes, was concluded to be only 56 per cent. of that of the solid plate; and, on this
“ principle the average strength of the plates tested would only be $\frac{50,442 \times 56}{100} =$
“ 28,247 lbs. per square inch of plate (reckoned as continuous) along the line of rivet
“ holes. Now a boiler of plates three eighths of an inch thick, of a quality equal to
“ that of the average of the five kinds of plate used in the experiments mentioned, the
“ dimensions and construction of the boiler being the same as those of the exploded
“ boiler, would have required a pressure of $28,247 \times \frac{3}{8} \div 36 = 294{\cdot}2$ lbs. per square
“ inch (as the load on the safety valves) to have burst it along a line of longitudinal rivets,
“ excluding the strength imparted by the ends of the boiler to the cylindrical part of
“ it; the ends would probably cause such a boiler to require not less than 300 lbs. per
“ square inch to burst it. It appears therefore that with *good* three-eighth inch plates
“ of their full thickness such a boiler as that which has exploded should have required
“ a pressure of 300 lbs. per square inch to have caused the explosion in what was

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Note.—I think it very desirable that the coal owners of this district should, more generally than at present, put their boilers under the care of some of the public companies established for the inspection of boilers; as the boilers at collieries are nearly always in use when an inspector of mines visits the collieries, it is impossible for him to examine them very minutely, except upon rare occasions.

“ naturally the weakest part of the structure. We must not, however, conclude from this, that the exploded boiler really required so high a pressure to cause it to explode. In the first place the plates are more or less thinned by corrosion, but this thinning only exists to a trifling extent along the fractured longitudinal seam, and generally along all the lines of fracture the plates appear to be nearly of their primitive thickness. The only place at which I have remarked any considerable loss of thickness being at the point marked X on the model, and it extends only for a short distance, and is in a naturally strong section of the boiler, besides which, the quality of the iron at the thin part is good, and hence I think that this thinness was not the primary cause of the explosion. But in the longitudinal line of rupture so frequently alluded to, some of the iron of the plates is at present very bad in quality, especially in the overlap portions where they have given way, and it is difficult to estimate correctly what pressure would be required to rend the boiler along a longitudinal seam, with iron of the quality of these plates. For my part, if I had not known the working pressure, I should, after an examination of the iron of these plates, and of the seams, have conjectured that they would have required about 100 lbs. per square inch of pressure to have rent them, that is to say, about one third of the bursting pressure due to average good plates. The working pressure was, however, little more than one third of this, so that I was at first inclined to think that some sudden pressure of much greater amount than the working pressure must have caused the first rupture; but on examining the four outer boilers, I found the scale upom them so nearly perfect, that I have no reason to think that over pressure has arisen from any of them having been overheated. Had any one of the series of boilers been low in water, and had the water in it been suddenly shaken so as to come in contact with the heated plates, it might have caused an overpressure, by way of the steam pipes over the whole of the boilers for a moment of time, but any sufficient amount of overpressure, however momentary and short in its duration, if of sufficient magnitude to rend the weakest joint or place exposed to it would be sufficient to account for the explosion, as the ruptured boiler would be torn by the ordinary and even less than the ordinary working pressure, after it was once extensively ruptured. As the unequal expansion caused by overheating a boiler through lowness of the water in it has a tendency to strain and weaken the boiler, I have seen the two boilers nearest to the engine tested by water pressure up to 100 lbs. per square inch, since the explosion, and found no more leakage than I should have expected to result from so high a pressure. No rupture resulted from these tests, and hence I am disposed to think that the plates along the fractured longitudinal seam, notwithstanding their being nearly of primitive thickness, have really given way under the ordinary working pressure of about 35 lbs. per square inch. I would repeat that when iron is of bad quality it is difficult to estimate what strain it will bear, and what it will not bear, before becoming ruptured; and although I should have expected this to have required 100 lbs. per square inch over the longitudinal section of the boiler to rupture it, I am, by the tests and examinations I have mentioned, driven to conclude that it has given way under the ordinary working pressure of little more than one-third of that amount. One of the plates adjoining the longitudinal seam, in particular, I consider to be of very bad quality at present, and unless this plate has formerly been nearer to the fire than it was at the time of the explosion, I am of opinion that it must have been a very bad plate when put into the boiler. The brittleness and weakness of the other plates, particularly the overlap parts, I think may, in a great degree at least, be accounted for by long exposure to the fire, and by having had to be fitted to new plates in repairing the boiler, a process by which the iron is often cracked and damaged by the use of a punch, used to get the rivet-holes of the old and new plates to coincide, which naturally injures the iron, and not unfrequently further weakens it by opening cracks in the plates. Iron long exposed to the hot air and gases from the fire naturally deteriorates in tenacity, and becomes hard and brittle, and exhibits a crystalline structure when broken, the fibre and toughness of the original plate being gone; and this is particularly observable at the overlap of the joints, where the outer plate is not exposed to the cooling influence of the water, but rather to the heating influence of the fire; and it seems probable that some parts of the weak iron noticed in this case has been due to this cause, although the iron when first put into the boiler, might be good in quality. It is unfortunately very difficult, if not impossible, without injuring the boiler, to ascertain the exact quality of iron that may have been deteriorated by continued exposure to the fire; and I believe it is common to depend upon leakage only, as an indication of weakness in boilers,

" except so far as a rude guess, as to the thickness and quality of the plates, may be " made by striking them with a hammer, and this I believe to be a very imperfect " guide. In this case I cannot ascertain that any leakage was observed just before the " explosion, nor do I conceive that ordinary care and caution, apart from leakage, could " have detected the weak state of the boiler. The plates, if of bad quality when put " into the boiler, might then have been by proper care ascertained to be of bad quality, in " my opinion; but I much doubt whether they were of bad quality when put into the " boiler, or whether they have not been of fair good quality when put in, and have " gradually deteriorated and turned bad by continued exposure to the hot air, smoke, " and gases from the fire. One notoriously bad plate, although at the time of the " explosion a long way off the fire, was still within the flue, and exposed to the hot " air and gases; and as I understand that this boiler was at one time fired from the " side, it may at that time have been immediately over, or so very close to the fire, as " to have become deteriorated. It may be observed that there was no name nor brand " found upon this plate, and this leaves room for suspecting that it has not been obtained " from any very celebrated manufacturer."

The jury returned the following verdict, "That the deaths of the deceased were " caused by the accidental explosion of the boiler, and that the accident did not occur " through the negligence of any party."

Reported serious personal injuries arising from non-fatal accidents.

A wide difference of opinion still appears to prevail amongst the agents of the collieries in this district as to the amount of personal injury which requires them, under the terms of the Act, to give notice of the accident by which it has been caused, to one of Her Majesty's Principal Secretaries of State, and to the Inspector for the district. In consequence of this great difference of opinion as to the intention of the words "serious personal injury," the notices received are of but little value in a statistical point of view, although in some instances they may be useful in calling the attention of the Inspector to matters attended with danger in or about the mines of his district.

In addition to the persons injured by the slight explosions of gas already mentioned, fourteen other non-fatal accidents were reported, by which three deputies and seven other classes of persons were hurt by falls of stone, and one person crushed by a coal tub, in the mines. Four persons were injured by the breaking of a winding rope, while they were ascending the shaft, in a cage attached to it at Willington Colliery belonging to Messrs. Straker and Love.

Two other persons suffered injury by being jammed by coal trucks and waggons on the surface railways near the tops of pits.

Complaints from Workmen.

Wingate Grange Colliery.

I visited Wingate Grange Colliery, on the 7th of January, to inquire into a complaint as to ventilation on the part of some of the workmen. I found the ventilation to be in accordance with the requirements of the first general rule in one of the districts complained of; the working of the other district had been discontinued before my visit.

South Pontop Colliery.

On the 16th February I investigated a complaint made on the part of the workmen of South Pontop Colliery as to the mode of working the Five Quarter and Brass Thill seams at that colliery, and made suggestions for the safe working of the same.

Butterknowle Colliery.

On the 19th of March I investigated a complaint on the part of the workmen at Butterknowle Colliery as to the ventilation there, and as to the danger which they apprehended from a dam, against which there was a great pressure of water. I made suggestions for the improvement of the ventilation, as I found the pit faulty in this respect, but as it was not at work at the time of my inspection I am unable to say whether it had or had not been sufficiently ventilated while it was being worked. The dam complained of was inaccessible, and from all the evidence I collected I believe that no danger is to be apprehended from its condition.

I had reasons to suppose that the complaints had been made with a view of getting the overman dismissed, as there appeared to be a strong feeling against him, on the part of the workmen.

Sacriston, Burnhope, and Pelton Collieries.

During the course of the year I also investigated complaints on the part of certain of the workmen of Sacriston, Burnhope, and Pelton Collieries, all of which I expect were arranged in a manner satisfactory to the workmen and also to that of their employers.

Cassop Colliery.

On the 19th of July, at the request of the workmen of the Vale pit of Cassop Colliery, I inspected the workmen in the Five Quarter Seam of that pit and found the ventilation very defective. After the inspection I wrote out the following statement in reference to my inspection, one copy of which was left with the viewer of the colliery, and another copy given to the workmen, who were on strike at the time in consequence of the state of the ventilation.

"19th July 1864.

"I have this day inspected the workings in the Five Quarter Seam in the Vale pit of "Cassop Colliery, and find the ventilation to be generally very slack and stagnant, and "a great want of the use of brattice for ventilating the working places; so much so that "it is difficult to ascertain the direction in which the air passes in many parts of the "workings. There is also in several places a considerable quantity of stythe or carbonic "acid gas mixed with the air, and under these circumstances, if the pit were working "and shots being fired, I can readily conceive that very many places in the pit are not "so ventilated as then to be in a proper state for being worked in. I believe that one "of the chief causes of this slack ventilation, at the time of my examination to day, was "the air descending the downcast shaft being nearly as warm and nearly as light as that "ascending the upcast shaft, owing to the hot weather; yet, in ordinary states of the "weather, I think the ventilation must be very slack with only the present small "furnace in the Main Coal Seam, and that the powder smoke from shots, in the absence "of brattice, must be a long time in being carried away from the workmen firing shots. "On a former occasion I think I was promised that brattice should be used in this Five "Quarter Seam, so that no place should be more than 14 yards before the air; I found "one place, to day, about 40 yards before the air, and without any brattice in it, and I "believe that the promise as to brattice being used has been broken. To remedy the "state of things above mentioned I would make the following suggestions, 1st,—that a "ventilating machine be put up at the Vale pit to draw the air through the mine and "the small upcast shaft, only about 24·6 square feet in area; or, as an alternative, "that a furnace be erected and used in the Five Quarter Seam to assist that at present "used in the Main Coal Seam in producing ventilation; 2nd, that the holing between "the Vale pit and the Old Cassop pit be accomplished within a month of this time as "promised by Mr. Curry, if required of him; 3rd, that such a travelling way and such "ample air ways be made between the Vale and the Old pit as shall both enable persons "to pass easily and quickly from one pit to the other, and, at the same time, be useful "for improving the ventilation of the Vale pit workings.

"JOHN J. ATKINSON,
"Government Inspector of Mines."

I again inspected the Five Quarter Seam workings on the 25th of July, and then found the ventilation much better than it was on the 19th, there being, on this occasion, a total circulation of about 3,900 cubic feet of air per minute; notwithstanding this, however, in many of the working places the lights burnt dimly, indicating either the presence of an undue proportion of carbonic acid gas, or an absence of the normal proportion of oxygen, in the atmosphere of the mine in these places.

Operations for improving the ventilation had been in progress during the interval between my visits on the 19th and 25th of July, respectively, the ventilating arrangements had also been altered; but, as the lights burnt dimly, I do not consider that the noxious gases had been rendered harmless, so as to comply with the requirements of the first general rule of the Inspection Act; and the men continued to refuse to go to work, until a further improvement should be effected.

On the 2d of August I once more inspected the workings, and found about 4,200 cubic feet of air circulating per minute; and on this occasion I concluded that the mine might be considered as being ventilated in accordance with the requirements of the first general rule of the Inspection Act, and the workmen resumed their work on the following day, the 3d of August, having lost a fortnight's employment.

On the 19th of September an action was brought by one of the workmen, in the Durham County Court, to recover wages for the time lost through the defective state of the ventilation.

On the part of the Defendant it was argued, that the following clause in the bond or contract under which the plaintiff was hired to work at the colliery was an answer to the action; viz.—

"The hewers are to be, one with another, during the whole period of their hiring "save for one fortnight between the 20th January and the 5th April, and save in con- "sequence of any accident happening to the engines or machinery placed in or upon

" any of the pits of the said collieries, or by reason of any accident to their safety, or by " reason of the same being in an improper or unsafe state, no less work than will yield " them at the afore-mentioned rates the sum of 30*s.* in each fortnight, or an average of " the three preceding consecutive fortnights. And that the said owner is empowered " to lay the pits off any number of days, allowing the hewers to have, one with another, " not less than 30*s.* per fortnight according to the afore-mentioned average."

It was contended that the wages guaranteed under this clause had been earned, notwithstanding the work that had been lost.

It was further argued that the pit was properly ventilated from and after the 25th of July, the date of my second inspection, and that the workmen ought then to have gone to work instead of remaining idle until after the 2nd of August.

Some doubts were entertained as to the proper interpretation of the clause in the bond which has just been quoted, and his Honour adjourned the case until the 10th of October.

On the 10th of October his Honour gave judgment for the plaintiff, for the balance which, according to his interpretation of the average clause, was required, in order to make the earnings of the Plaintiff alone, and apart from the earnings of the other workmen, up to the guaranteed sum of 30*s.* per fortnight, on the average of the fortnight when the pit was off work, together with only the *two* preceding fortnights.

On the 25th of January of the present year five more of the Cassop Colliery workmen brought actions against Mr. Hilton Philipson, the owner of the colliery, to recover the sum of 2*l.* 8*s.* each, for the time lost in consequence of the bad state of the ventilation between the 18th of July and the 3rd of August (being, in effect, a new trial of the same case) in the County Court at Newcastle-upon-Tyne.

The plaintiff in the first of the cases and two other workmen as well as myself gave evidence in this instance. No witnesses were examined for the defence, which was rested upon the following points:—

1st. It was contended that the plaintiff had broken his contract of hiring by not having worked on all the days when the pit was worked, and that he, therefore, had no claim against the owner of the colliery; because, while a special contract remained unperformed, the party whose part of the contract remained unperformed could not sue until the whole was completed.

His Honour did not appear to consider that this breach of contract by the plaintiff had been proved, and intimated that even if it were proved, he still thought that a penalty would be all that the plaintiff would have incurred, so that his present claim would remain unaffected by it.

2nd. It was contended that the plaintiff had earned the wages guaranteed to him by the bond, and that he, therefore, could not claim any more.

3rd. It was also alleged, on the part of the defendant, that the ventilation had been rendered defective by reason of a hole in the shaft brattice opening a communication between the downcast and upcast currents of air, and by the hot state of the weather at the time, and that, consequently, the circumstances were not of an ordinary character; and that hence the first general rule of the Act had not been infringed.

His Honour intimated that he did not consider that the clause as to the average earnings was applicable to a case like the one under notice, nor did he consider that a hole in the shaft-brattice, or the warm state of the weather, were circumstances of an extraordinary character under the meaning of the first general rule of the Act; and he considered that the plaintiff was entitled to recover 2*l.* 8*s.*, the full amount claimed; and he gave judgment accordingly.

Judgment was consented to in the remainder of the cases without the defendant being involved in the merits.

The ventilation of the pit has been much improved since the beginning of August 1864.

Thistleflat or Low Bitchburn Colliery.

In August I was applied to by Thomas Cooper, who stated that his brother, William Cooper, had taken suddenly ill a short time previously, while at work as a coal hewer, in Thistleflat or Low Bitchburn Colliery, and had died shortly after he was taken home; and that he (Thomas Cooper) suspected that his death had been caused by the presence of carbonic acid gas, or stythe, in the mine; and he wished me to investigate the case in order to ascertain whether this was so or not.

I examined the place, and found the ventilation small in amount, but at the time of my visit I considered it sufficient as a mere compliance with the first general rule.

I was, however, told that an improvement had been made in the ventilation of that part of the mine, between the time when Cooper was taken ill and the time of my visit of inspection, and hence I collected evidence as to its state at the former period from the workmen employed near the place. I also obtained the opinions of the surgeons who attended upon William Cooper during his illness, as to the cause of his death.

The evidence was conflicting, and as there seemed to be doubts as to whether death had really resulted from inhaling noxious gas or not, after the details of the case were laid before you, I was instructed to inform Mr. John Sharp, the owner of the colliery, that if he would pay the widow of the deceased the sum of 20*l.* (as he had previously offered), no legal proceedings, for the purpose of trying to inflict a penalty for a breach of the first general rule of the Mines Inspection Act would be instituted against him.

He was informed of this, and paid the widow the sum of 20*l.* through myself.

Reference cases as to an extension of time for providing second shafts or outlets at collieries having only a single shaft.

During the six months ended the 31st December 1863, the owners of the following collieries sent in claims to have arbitrations to decide as to whether they were to be allowed an extension of the time for providing second shafts or outlets; and in each case the arbitrators granted an extension of the time otherwise prescribed by the Act 25 & 26 Vict. cap. 79.; the several extensions of time so granted are stated below, opposite to the names of the respective collieries:—

Adelaide	Colliery,	15 lunar months from 31st October 1864.
Castle Eden	do.,	2½ years from 19th November 1864.
Coxhoe	do.,	8 months from 1st January 1865.
Ryhope	do.,	4 years from 31st December 1864.
Belmont	do.,	13 months from 1st January 1865.

Alexandrina Pits of Rainton Colliery, 6 calendar months from 31st October 1864.

The new shafts are in progress of sinking at each of these collieries at the present time.

Employment of boys under twelve years of age, and means adopted for their education.

Under the Act for the Regulation and Inspection of Mines the following are the provisions for the employment and education of boys in mines:—

1st. Boys who are upwards of twelve years of age may be employed in mines independent of any educational acquirements, or attendance at schools after they are employed:

2nd. Boys above ten and under twelve years of age may be employed in mines, only upon one of the following alternative conditions:
  (*a.*) If they can read and write, and produce a certificate to that effect under the hand of a competent schoolmaster;
  (*b.*) If, being unable to read and write, they produce, each month of their employment, a certificate under the hand of a competent schoolmaster to the effect that they have attended school for not less than three hours per day, on two days of each week during the preceding month.

At probably about two thirds of the collieries in the district, no boys are allowed to commence to work underground until they are twelve years of age, and where this is the voluntary regulation the educational clauses of the Act do not interfere, nor require attention.

In such cases it is probable, however, that in a few instances the parents of children will represent them as having reached twelve years of age before they really have attained that age, in order to get them employed sooner than they otherwise could.

At the collieries where the above voluntary regulation is not adopted, I believe that in a large majority of instances there is a tendency in the same direction, and that the proportion of boys allowed to commence to work in the mines before reaching twelve years of age is very small indeed in comparison with the number who are upwards of twelve years of age, when they are allowed to commence to work in the mines.

Many boys, however, under twelve years of age, and a few under ten years of age, are employed about the screens and small coal apparatus at the tops of the pits, and generally in above-ground operations, where no educational attainments are required by the Act.

The extensive practice of declining to employ boys underground in the mines of this district, unless they are either above 12 years of age on the one hand, or above 10 years of age, and able to read and write on the other hand, is, I believe, almost entirely due to the dislike of the colliery agents to have the trouble of obtaining certificates of school attendance, as they are generally fully employed with their ordinary every day duties; in some instances, however, the practice is probably adopted with a view of causing the boys to get a better education than they would otherwise be likely to obtain.

A considerable number of colliery agents think the law would be improved if all boys under 12 years of age were excluded from being employed underground in the mines; not considering that this might be attended with inconvenience to coal owners in other districts.

The coal owners and agents of this district do not complain of the requirements of the law, as to the employment of boys in the mines, but I am of opinion that many of them would do so, if they were under the necessity of employing boys between 10 and 12 years of age, who could neither read nor write, and so were compelled to obtain and file the certificates of school attendance that would in that case be required by the Act.

I am informed that a few of the parents of boys who are refused employment (under the voluntary regulation) because they are under 12 years of age, complain that the law deprives them of the earnings which their children would have obtained, had there been no such law in existence; these complaints emanate, I believe, for the most part, from persons having large families of girls or young children; and at some collieries the general regulation against employing boys under 12 years of age in the mines, is, I believe, relaxed only to meet such cases.

I am inclined to think that a majority of colliery workmen, if left to themselves, would prefer that there should be no legal restraint as to the employment and education of their children; because, under such circumstances, they could each keep their children at school, and from being employed as long as might suit them; and would neither be prohibited from sending their children to work, nor compelled to send them to school, against their wishes and inclinations, at least by the law.

I believe that it is chiefly a few of the workmen who are desirous of promoting education amongst their own class (and who consequently, for themselves, need no law to force them to educate their own children) that induce their less thoughtful fellow workmen to sign petitions for legal enactments which put restraints upon them in the matter of employing and educating their children.

The practice of allowing boys who can read and write, to commence to work in mines at an earlier age than those who cannot do so, holds out an inducement to many parents to get their children taught.

I do not suppose that there are a dozen collieries in this district where the practice of allowing boys between 10 and 12 years of age, and at the same time unable to read and write, to commence to work in the mines is recognized and followed; but in the rare instances where it is acted upon, I believe that certificates are obtained as to school attendance with general regularity.

I am informed that some colliery agents in the district, frequently have to refuse parents their request to have their boys employed in the mines, either from the boys being too young and not having the educational requirements of the Act necessary to prevent their having to attend school on the one hand, or from the voluntary rule of not allowing boys under 12 years of age to be employed in the mines under their care on the other hand.

The regulations under the present mines Inspection Act, in reference to the education and employment of boys in mines, are productive of the following advantages:—

1st. They, to a certain extent, prevent boys of too tender ages being appointed to fill posts of trust or of danger in the mines, and, so far, have a tendency to prevent the occurrence of accidents in mines.

2d. They hold out an inducement for parents to get their boys taught to read and write, in all cases where the voluntary regulation of not employing boys till they can do so on the one hand, or until they are 12 years of age on the other hand prevails. The voluntary regulation itself, really being the offspring of the legal enactment, in order, in many instances at least, to save the trouble of obtaining certificates of schooling.

3d. Even in cases when boys between 10 and 12 years of age are employed in mines, they provide for a certain amount of schooling for them.

Many of the coal owners contribute liberally to the support of schools in connection with their colliery villages.

Number of collieries in the District.

There are only 160 collieries in this inspection district, but many of them are very extensive, and on the whole they yield a larger quantity of coal yearly than is produced in any other inspection district.

I have, &c.
(Signed) John J. Atkinson,
Inspector of Mines.

To the Right Hon. Sir George Grey, Bart., M.P.,
Her Majesty's Principal Secretary of State
for the Home Department,
&c. &c. &c.

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS OF LIFE arising therefrom, in the SOUTH DURHAM MINES INSPECTION DISTRICT, during the Year ending 31st day of December 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.														
Jan. 4	1	South Hetton -	South Hetton -	South Hetton Coal Co. -	Robert Milburn -	Hewer -	31	Fall of stone - - -	—	1	—	—	—	1
„ 7	2	Pease's West E. pit.	Hedley Hope -	Joseph Pease and Partners	John Graham -	Deputy -	27	Ditto. drawing timber in broken	—	1	—	—	—	1
„ 8	3	Shincliffe -	Durham -	Joseph Love and Partners	Alexander Hutton	Fireclay worker.	25	Fall of stone -	—	1	—	—	—	1
Feb. 10	4	Nettlesworth -	Chester-le-Street	Jonassohn and Elliot -	John Bainbridge -	Deputy -	27	Fall of stone, drawing a jud -	—	1	—	—	—	1
„ 20	5	Grange -	Durham -	N. Wood and Partners -	John Davidson -	Ditto -	41	Ditto - -	—	1	—	—	—	1
„ 26	6	Pease's West (Job's Hill $\frac{5}{4}$).	Crook -	Joseph Pease and Partners	John Galllighar -	Hewer -	25	Crushed by tubs -	—	—	—	1	—	1
Mar. 2	7	Auckland Park	Auckland -	Black Boy Coal Co. -	Walter Tate -	Deputy -	38	Fall of stone, drawing timber -	—	1	—	—	—	1
„ 9	8	Etherley Jane pit	Ditto -	H. Stobart and Partners -	Anthony Maddison	Minding chocks.	15	Crushed by tubs in inclined plane -	—	—	—	1	—	1
„ 9	9	Norwood Hall pit.	Cockfield -	Gordon House Coal Co. -	John Stephens -	Attending small waggon.	12	Smothered by small coals in a waggon	—	—	—	—	1	1
„ 10	10	Kepier Grange	Durham -	Kepier Grange Coal Co. -	Francis Johnson -	Driver -	13	Crushed by tubs -	—	—	—	1	—	1
„ 11	11	Murton Colliery	South Hetton -	South Hetton Coal Co. -	Timothy Downey -	Hewer -	39	Fall of stone - -	—	1	—	—	—	1
„ 23	12	Hetton Colliery	Hetton -	Hetton Coal Co. - -	George Scott -	Ditto -	25	Ditto - - -	—	1	—	—	—	1
April 6	13	Lumley, 2d pit	Houghton -	Earl of Durham - -	Robert Brown -	Driver -	12	Crushed by tub - -	—	—	—	1	—	1
„ 6	14	Shincliffe -	Durham -	J. Love and Co. - -	Thomas Elliott -	Ditto -	13	Ditto - -	—	—	—	1	—	1
„ 11	15	Seaton - -	Seaham -	Marchioness of Londonderry.	William Fairley -	Stoneman -	42	Burnt by explosion of gas - -	1	—	—	—	—	1
„ 13	16	Old Etherley -	Auckland -	Henry Stobert and Co. -	Jacob Briddick -	Pony putter	17	Crushed by tubs - -	—	—	—	1	—	1
„ 17	17	Burnhope -	Lanchester -	- - -	William Green -	Flatboy -	15	Ditto - - -	—	—	—	1	—	1
„ 22	15	Seaton - -	Seaham -	Marchioness of Londonderry.	Tristram Hepple -	Master shifter	50	Explosion of gas - -	1	—	—	—	—	1
„ 23	18	Shildon Lodge	Auckland -	Bolckow and Vaughan -	Thomas Sugdon -	Sinker -	34	Killed by falling off a cradle in the New pit.	—	—	1	—	—	1
„ 23	„	Ditto - -	Ditto - -	Ditto - - -	John Rogan	Ditto -	20		—	—	1	—	—	1
„ 22	19	Pelton - -	Chester-le-Street	W. C. Curtis and Co. -	Thomas Kellett -	Deputy -	40	Fall of stone, drawing timber -	—	1	—	—	—	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.														
May 4	20	Newbottle	Houghton	Earl of Durham	William Roxby	Hewer	23	Fall of stone	—	1	—	—	—	1
„ 5	21	North Hetton	Hetton	North Hetton Coal Co.	Mark Wilson	Screener	50	Crushed by waggons at screens	—	—	—	—	1	1
„ 5	22	Leasingthorn	Bishop Auckland	Black Boy Coal Co.	John Akersley	Hewer	42	Fall of stone	—	1	—	—	—	1
„ 6	23	Thornley	Ferry Hill	Thornley Coal Co.	James Laughren	Hewer	30	Explosion of gas	1	—	—	—	—	1
„ 11	24	Seaton	Seaham	Ditto	John Souther	Stoneman	58	Fall of stone	—	1	—	—	—	1
„ 13	25	Kepier Grange	Durham	Kepier Grange Coal Co.	Jas. Brown	Fireman	33	Killed by the explosion of a boiler	—	—	—	—	1	1
„ 13	„	Ditto	Ditto	Ditto	John Miller	Not employed	10							
„ 13	„	Ditto	Ditto	Ditto	Willm. Grainger		8							
„ 13	26	Seaham	Seaham	Marchioness of Londonderry.	John Wilson	Pony putter	15	Crushed by tub	—	—	—	—	1	1
„ 17	27	Brancepeth	Durham	Straker and Love	Mark Nicholson	Deputy	21	Fall of stone, drawing timber	—	—	—	—	1	1
„ 18	28	Tursdale	Ferry Hill	Cochrane and Co.	Joseph Bell	Putter	17	Crushed by tub	—	—	—	1	—	1
„ 28	29	Bitchburn	Crook	Straker and Love	Willm. Birtley	Deputy	28	Fall of stone	—	1	—	—	—	1
„ 25	30	South Pelaw	Chester-le-street	Hunt, Perkins, and Co.	Edward Hurworth	Switchkeeper	10	Crushed by tubs in inclined plane	—	—	—	1	—	1
June 10	31	Dryburn Grange	Durham	Lady Londonderry	George Cole	Onsetter	54	Crushed by descending cage	—	—	1	—	—	1
„ 15	32	St. Helen's, E. pit.	Auckland	Joseph Pease and Partners	Nathan Robinson	Fireman	22	Scalded or drowned in delivery drift.	—	—	—	—	1	1
„ 16	33	St. Helen's Wooley	Crook	Ditto	Robert Walton	Sinker	24	Fall of stone in shaft	—	—	1	—	—	1
„ 17	34	Haswell ($\frac{5}{4}$ seam)	Hetton	Haswell Coal Co.	John Brown	Putter	14	Fall of stone	—	1	—	—	—	1
„ 22	35	Haswell	Ditto	Ditto	John Young	Horse driver	13	Killed by waggons on branches	—	—	—	—	1	1
July 1	36	Pease's West (Job's Hill.)	Crook	Joseph Pease and Partners	James Watson	Hewer	25	Fall of stone, drawing timber	—	1	—	—	—	1
„ 4	37	Stanley pit	Ditto	Ditto	Jno. Thompson	Joiner	69	Fell from top of shaft	—	—	1	—	—	1
„ 13	38	Wooley pit	Ditto	Ditto	Rob. Mason	Sinker	—	Killed by shot in sinking pit bottom.	—	—	1	—	—	1
„ 16	39	Sherburn	Durham	Earl of Durham	James Bell	Wailer	10	Falling into hot water	—	—	—	—	1	1
„ 18	40	Elm Park	Crook	Bainbridge and Co.	John Sharp	Apparatus boy	16	Breaking of apparatus chain	—	—	—	—	1	1
„ 18	41	Hetton (Blossom pit.)	Hetton	Hetton Coal Co.	John Platts	Deputy	36	Fall of stone	—	1	—	—	—	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.														
June 19	42	Shotton (Harvey Seam).	Hetton	Haswell Coal Co.	James Banghan	Driver	12	Fell down a 12 fathom staple	—	—	1	—	—	1
„ 21	43	Woodfield	Crook	Bolckow and Vaughan	John Diamon	Mason	36	Fall of stone	—	1	—	—	—	1
July 22	44	Sherburn	Sherburn	Earl of Durham	Matthew Taylor	Deputy	54	Fall of stone, drawing timber	—	1	—	—	—	1
„ 28	45	Thornley	Ferry Hill	Thornley Coal Co.	James Mandlin	Back overman	59	Crushed by tubs in engine plane	—	—	—	1	—	1
„ 29	46	Murton	Murton	South Hetton Coal Co.	George Laws	Deputy	63	Fall of stone, drawing timber	—	1	—	—	—	1
„ 30	47	Eppleton (Jane pit).	Hetton	Hetton Coal Co.	John Walton	Hewer	26	Fell down shaft from Main Coal Seam	—	—	1	—	—	1
„ 30	48	North Hetton	Ditto	North Hetton Coal Co.	Edward Taylor	Fireman	17	Killed by a boiler explosion	—	—	—	—	1	1
„ 30	„	Ditto	Ditto	Ditto	W. T. Palmer	Ditto	19		—	—	—	—	1	1
„ 30	„	Ditto	Ditto	Ditto	John Wild	Infant	11 mths.		—	—	—	—	1	1
„ 30	49	Ryhope	Sunderland	Messrs. Taylor and Co.	Christopher Labiden	Driver	13	Crushed by tubs	—	—	—	1	—	1
Aug. 2	50	Bowdon Close	Willington	Joseph Pease, Esq., and Partners.	William Stewart	Hewer	50	Fall of stone taking off coal	—	1	—	—	—	1
„ 3	51	Murton	Murton	South Hetton Coal Co.	Robert Storey	Trimmer	15	Crushed by a surface waggon	—	—	—	—	1	1
„ 5	52	Houghton	Houghton	Earl of Durham	John Bell	Shaftman	54	Crushed by cage at shaft bottom	—	—	1	—	—	1
„ 10	53	Murton (Polka Pit).	Murton	South Hetton Coal Co.	Thomas Hall	Wasteman	76	Crushed by tubs in engine plane	—	—	—	1	—	1
„ 31	54	Bowden Close	Willington	Joseph Pease and Partners	Thomas Fletcher	Waggonrider	31	Crushed by waggons	—	—	—	—	1	1
Sept. 2	55	West Auckland	Auckland	Bolckow and Vaughan	William Akenhead	Apparatus onsetter.	14	Crushed by spur wheel	—	—	—	—	1	1
„ 2	56	Ryhope	Ryhope	Messrs. Taylor and Co.	George Kirtley	Hewer	53	Fall of stone	—	1	—	—	—	1
„ 6	57	Coxhoe	Coxhoe	West Hartlepool Railway Co.	E. Stephenson	Wood leader	16	Fell part way down shaft	—	—	1	—	—	1
„ 24	58	Waldridge	Chester-le-Street	Owen Wallis and Co.	William Toward	Enginewright	24	Ditto	—	—	1	—	—	1
„ 29	59	Thornley	Thornley	Thornley Coal Co.	Robert Armstrong	Pony putter	14	Fall of stone	—	1	—	—	—	1
„ 30	60	Willington	Willington	Love and Strakers	James Fisher	Deputy	31	Ditto	—	1	—	—	—	1
Oct. 3	61	East Hetton	Coxhoe	J. Forster	George Gibbon	Wailer	11	Crushed by duff sheave on waste heap	—	—	—	—	1	1
„ 4	62	Wingate Grange	Wingate	John Gully, Esq.	Thomas Clement	Pony putter	17	Crushed by tub	—	—	—	1	—	1
„ 5	63	Eppleton (Jane Pit).	Hetton	Hetton Coal Co.	William Sharp	Putter	17	Ditto	—	—	—	1	—	1
„ 12	64	Rainton	Rainton	Marchioness of Londonderry.	Edmund Guy	Station keeper.	14	Crushed between tub and crowntree	—	—	—	1	—	1

List of Fatal Colliery Accidents—*continued.*

Date	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864. Oct. 18	65	Thornley($\frac{5}{4}$seam)	Ferry Hill	Thornley Coal Co.	William O'Brien	Tramway cleaner.	13	Crushed by tub	–	–	–	1	–	1
„ 19	66	Frankland	Durham	Earl of Durham	Anthony Pearson	Shifter	35	Fell from top of shaft	–	–	1	–	–	1
„ 24	67	Eppleton (Jane pit.)	Hetton	Hetton Coal Co.	Thomas Lewens	Stoneman	40	Crushed by set amain in engine plane, broken break	–	–	–	1	–	1
„ 29	68	Houghton	Houghton	Earl of Durham	William Warner	Shifter	20	Prop falling from top of pit	–	–	1	–	–	1
„ 31	69	Adelaide	Bishop Auckland	Jos. Pease and Partners	William Young	Sinker	32	Fell part way down sinking pit upon two shots.	–	–	1	–	–	1
Nov. 10	70	Houghton(D.pit)	Houghton	Earl of Durham	Nicholas Wilkinson	Hewer	34	Fall of stone	–	1	–	–	–	1
„ 13	71	Moorsley	Hetton	North Hetton Coal Co.	William Bell	Pony driver	16	Ditto	–	1	–	–	–	1
„ 15	72	Nettlesworth	Chester-le-Street	Elliot and Johassohn	Hugh Dickinson	Hewer	30	Killed by a tub falling down shaft upon him.	–	–	1	–	–	1
„ 26	73	Houghton	Houghton	Earl of Durham	William Brown	Hewer	27	Fall of stone	–	1	–	–	–	1
Dec. 2	74	Shincliffe	Durham	J. Love and Co.	Thomas Davison	Shifter	60	Killed by machinery at top of staple	–	–	1	–	–	1
„ 2	75	Eppleton	Hetton	Hetton Coal Co.	George Wilkinson	Trapper	12	Crushed by tubs	–	–	–	1	–	1
„ 3	76	Do. (Jane pit)	Ditto	Ditto	Charles Hennery	Drum boy	15	Killed by being lapped upon the drum.	–	–	–	1	–	1
„ 5	77	Low Bitchburn	Crook	John Sharp	James Bland	Driver	12	Crushed by tub	–	–	–	1	–	1
„ 6	78	Bowden Close	Willington	Jos. Pease and Partners	John M'Durmot	Driver	12	Crushed by tubs in inclined plane	–	–	–	1	–	1
„ 21	79	Woodhouse Close	Auckland	Sir C. F. M'Lean	James Park	Brakesman	36	Crushed by machinery	–	–	–	1	–	1
„ 23	80	Brancepeth	Willington	Straker and Love	John Williams	Platelayer	16	Fall of stone	–	1	–	–	–	1
„ 26	81	Sherburn(E. pit)	Sherburn	Earl of Durham	Michael Melvin	Hewer	21	Ditto	–	1	–	–	–	1
„ 28	82	Wingate Grange	Wingate	Gully's Executors	George Jawes	Switchkeeper	11	Crushed by tubs	–	–	–	1	–	1
„ 31	83	Heugh Hall	Coxhoe	W. H. H. and Railway Co.	William Burrell	Pony putter	15	Fall of stone, timber knocked out by pony.	–	1	–	–	–	1
								Total	3	30	16	24	16	89

Mr. Dickinson's Report.

REPORT on the INSPECTION of MINES in the NORTH and EAST LANCASHIRE or MANCHESTER DISTRICT for the Year ended 31st December 1864.—By JOSEPH DICKINSON, Esq., F.G.S.

SIR, Manchester, February 28, 1865.

IN conformity with the provisions of the Mines Regulation and Inspection Act, I have the honour to transmit to you the following Report.

The accidents.

During the year 1864 the fatal accidents to persons employed in and about the coal mines of the North and East Lancashire or Manchester district have amounted to 60 separate occurrences, and they have been attended with loss of life to 64 coal miners. In 56 of these occurrences 1 life was lost by each accident, and in the remaining 4 the loss was 2 lives by each accident.

The number of fatal accidents in 1864 is exactly the same as it was in the year 1863, but the number of lives lost is 4 fewer than in that year; and in both the accidents and the lives lost there is a diminution as compared with the average of preceding years.

The 60 fatal accidents in 1864 have been 5 explosions of fire-damp, with a loss of 5 lives; 29 falls of the roof, coal, or sides of workings, with a loss of 33 lives; 13 shaft accidents, with a loss of 13 lives; 10 miscellaneous underground accidents, with a loss of 10 lives; and 3 miscellaneous surface accidents, with a loss of 3 lives.

The fatal accidents occurred at the following collieries:—

Collieries where the accidents have taken place.

Owners.	Collieries.	Accidents.	Lives Lost.
Arley Main Company - - - -	Arley Main - - -	1	1
Barnes, Joseph, Executors of - -	Dunkenhalgh Park - -	2	2
Booth and Marland - - -	Honeywell Lane - -	1	1
Bradford, The Earl of - - - -	Great Lever - -	1	1
Brandwood, John, Executors of - - -	Scholesfold - - -	1	1
Bridgewater Trustees - -	Bridgewater - - -	5	5
Butterworth, Thomas - -	Bent Grange - - -	1	1
Bullough, Adam - -	Waterside - -	1	1
Chamber Company - - - -	Oak, Chamber, and Chadderton -	3	4
Fletcher, Ellis, Trustees of - -	Clifton and Kearsley - - -	3	3
Fletcher, John - - -	Ladyshore - - -	3	3
Fletcher, John, and others - - -	Atherton - - -	1	1
Fletcher, Thomas, and Sons - -	Cloughside - -	1	1
Hargreaves, Ashworth, and Co. - - -	Rossendale - -	1	1
Hargreaves, John, Executors of - -	Burnley, &c. - - -	4	4
Harrop, Jonah, and Co. - - -	Bardsley Bridge - - -	1	1
Hulton Company - - - -	Hulton - - -	2	2
Kirkless Hall Company - - -	Westleigh - - -	1	1
Leather, Samuel - - - -	Dootson and Vauze - -	1	1
Lordsfields Company - - - -	Lordsfields - - -	2	3
Knowles, Andrew, and Sons - - -	Agecroft - - -	3	3
Ditto - - -	Clifton Hall - - -	2	2
Ditto - - -	Lever - -	2	2
Ditto - - -	Pendlebury - - -	3	3
Leeses, Jones, and Company - - -	Holebottom - - -	1	2
Leigh and Bradbury - - - -	Clayton - - -	1	2
Pollitt, John - - - -	Pilsworth - - - -	1	1
Roscoe, James and William - - -	New Watergate and Peel Hall -	1	1
Roscow and Lord - - - -	Chadwick Hall - - -	1	1
Scowcroft, Samuel - - - -	Rose Hill - - -	1	1
Shaw, Thomas - - - -	Haughton - - - -	1	1
Stand Lane Company - - - -	Stand Lane - -	2	2
Stanley, John, Executors of - - -	Moston - - - -	1	1
Tyldesley Company (Green and Co.) - -	Tyldesley - - -	1	1
Whittle, Thomas and William - - -	Duxbury - - - -	1	1
Wright, John - - - -	Bank - - -	2	2
		60	64

Working of the Acts.

The district has continued free from any great accident, and generally the provisions of the law appear to be working well. Some violations have occurred which could not, consistently with proper and reasonable enforcement of the law, be overlooked; and in the following instances penalties have been imposed.

Penalties imposed.

	£
The fireman, Bent Grange Colliery, for neglecting to set signals - -	1
The owner, Great Lever Works Colliery, not providing adequate ventilation, 2*l.*; not fencing off gas, 2*l.*; not causing the safety lamps to be examined and locked, 2*l.* - - - - - - -	6
The manager, Scholesfold Colliery, not providing shaft signals - -	1
The manager, Stand Lane Colliery, not providing refuge places - -	5
The owner, Bent Grange Colliery, employing a boy between 10 and 12 years of age without a certificate - - - - - - -	5

The 5*l.* for not providing refuge places has been given to the widow of the miner who was killed, and a moiety of the 5*l.* for employing the boy without a certificate I have given to the schools at Oldham. The other fines have been paid to the receiver of Government fines to be applied to the Consolidated Fund, as the Act directs.

Hulton Colliery proceedings.

In addition to the foregoing, I also caused proceedings to be taken against the owners of the Hulton Colliery, with reference to the fireman who got suffocated by fire-damp. The colliery had for some time been without an underground manager, except the underlooker, and when I inspected the pit I found about one-half of the workings filled with fire-damp and ready for a general explosion, which might have killed every person below ground. I considered there had been serious neglect in allowing such a state of ventilation to continue, but the justices, although approving of the case being brought forward, did not convict. Shortly after this, the mine took fire at a shot which ought to have been fired by the underlooker's assistant, but who was off duty, and the pit had in consequence to be inundated with water; and before the year was out an explosion of fire-damp happened by which a miner was burned, open lights in this instance being allowed, although it was prominently set forth on a board at the pit head that safety lamps only were allowed to be taken down the shaft. The result, however, has not proved altogether discouraging. A new underground manager has now entered upon the duties, which gives ground for hoping that in future such irregularities as I have noticed will cease.

Certificates as to education.

The restrictions with regard to the employment of boys between the ages of 10 and 12 years continue to give a move to instruction, as they were intended. They are accompanied, however, with some hardships by preventing boys whose maintenance is not provided for from getting employment below ground, and who are thereby compelled either to be idle or to seek other work, which causes the restrictions to be occasionally complained of as an unnecessary restraint upon colliery labour.

Prohibition of single shaft.

The time specified by the Act 25 & 26 Vict. c. 79, within which any application for an extension of time to provide a second shaft or outlet, expired on the 31st day of December last. Only one application for an extension of time was made in this district, and the claim has just been arbitrated and six months allowed for completing the second shaft. No application for exemption had been made in the previous time specified. The Act, therefore, except at the above colliery, is now in full application at both old and new mines.

The Collieries.

There are about 282 collieries in this district, and which, from the latest enumeration that I have made of them, consist of about 737 separate shafts or outlets to the surface; and they have altogether a length of about 4,000 or 5,000 miles of underground roads which require to be kept open and ventilated. In rare instances seams, such as the Cannel coal, and in some outlying places other coals also, are worked of only about one foot in thickness; but these are exceptional instances, and form but a small portion of the whole. Some of the seams are about 10 feet in thickness; and a large number are between three and six feet. Almost every mine produces fire-damp, and where that has not been yet met with there is choke-damp. White damp, in which life fails, but lights burn, has only been occasionally met with, and then, generally, when there has been a fire in the mine. Many of the seams are very steep, which in some respects adds to the difficulty and danger of working the coal. On the average about one ton of coal per diem, or in round numbers say 300 tons of coal per annum is produced per person employed in and about the collieries. The Census Tables show that the coal miners of all ages in this district were—

Coal produced and miners employed.

1851.	1861.
18,249	23,525

These numbers do not include the females who were employed on the pit-banks, and possibly many of the smiths, carpenters, stablemen, &c., employed in or about the collieries, and over whom the average get of coals is spread, may not be included. But according to this number, returned as miners, the quantity of coal produced in the year 1861 would be 7,057,500 tons. The number of miners is probably about the same now as it was in 1861; but in the year 1864 the quantity of coal produced would be only about 5,998,875 tons, or 15 per cent. less than the average, arising from the cotton factories, and works depending upon cotton, not being fully at work. In the year 1863, when the depression appeared to be greatest, the quantity would be only about 5,275,000 tons, or nearly 25 per cent. less than the average.

Proportion of accidents to miners employed and coal raised.

The number of separate fatal accidents being 60, and the total lives lost 64; there have therefore been in the year 1864—

	Coal Miners employed.		Tons of Coals raised.
1 separate fatal accident to every	392	and	99,981
1 life lost to every - -	367	and	93,732

Synopsis of the accidents and lives lost in this district.

Year.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	10 Years Average.	1862.	1863.	1864.
Separate Accidents	60	60	73	78	73	52	60	55	55	67	63·3	56	60	60
Lives lost - -	113	82	87	89	84	99	138	68	58	82	90·0	59	68	64

During the 10 years ending 1861 there would be an average of about 20,887 coal miners employed, which, at the rate of 300 tons per person, makes the average production during that time 6,266,100 tons per annum. This quantity divided by the average number of 63·3 separate fatal accidents, and 90 lives lost, gives for 10 years an average of

	Coal Miners employed.		Tons of Coal raised.
1 separate fatal accident to every	330	and	98,990
1 life lost to every - -	232	and	69,623

Which shows that in the year 1864 (and which also holds good with respect to 1862 and 1863) there have been considerably more persons employed, and more coal produced in proportion both to each separate fatal accident and to each life lost than in the preceding 10 years.

Scope of the Inspection.

In my reports for the year 1858 and 1862, and also at other times, I have gone into the subject and shown the real scope of the Government Inspection of mines. I now find in an increasing number of instances that the miners avail themselves of the means within their reach of having danger removed by giving me information of it, by which, in all probability, accidents are being avoided. Having now had more years of experience, I may repeat what I have said, to the effect that it is not intended, nor is it desirable, that the Inspectors should act as the viewers or managers of the collieries, but to be in the districts that matters may be referred to them. That in case of complaint or reason to suspect danger the pits may be inspected and the requisite steps taken to remedy it without an accident occurring. And, that when any accident has occurred, which appears to require it, investigation may be made in order to ascertain whether the provisions of the law have been complied with, and, that if necessary, the penalties for neglect may be proceeded for. It is apparent that when accidents have occurred, investigations press the responsibility of the management upon the only parties to whom it attaches, and are the means of causing precautions to be taken which are likely to prevent recurrence of accidents. Mines continually require attention. New roads are daily being made as the coal is worked, requiring renewed propping and frequent changes in the ventilating arrangements, and the ventilating power must be regularly kept up; wear and tear also are constantly going on of the ropes, steam boilers, machinery, pit shafts, &c. If the view taken by some parties, therefore, that inspection should reach further than this were acted upon, it would tend to relieve the owners and managers of mines of the responsibility which now devolves upon them and to throw it upon the Government, which, unless the Inspectors were made as numerous as the managers and had an equally numerous staff, with power of control over the expenditure, they could not possibly undertake.

Coroner's inquests.

A change of coroners has taken place in one of the divisions of this district—John Hargreaves, Esquire, after being coroner for the Hundred of Blackburn since the year 1810, having retired in consequence of old age. During the nearly fifteen years since the inspection of coal mines commenced I have attended many colliery inquests which he has held; and as the practice pursued by a coroner of such long experience is of public importance, especially as so much latitude is allowed in discharging the duties of the office, it therefore gives me much pleasure to say that his practice has been to make them useful, not only for arresting gross carelessness (to which some coroners almost exclusively confine the inquiry, and which is apparently the least useful part of the duty, as that is now generally supplied by the justices), but also for investigating and formally pointing out to the persons concerned the lesser degrees of neglect, from which much good has apparently resulted, and probably recurrence of accidents has been avoided. Mr. Hargreaves is succeeded by his son, who has for many years been the deputy coroner, and who follows the same practice in the investigation of colliery accidents as his father.

In the coroner's district of the South-western division of the Hundred of Salford, which comprises many miles all round Manchester, the mining and manufacturing population has increased so much within recent years, and there being so many inquests to be held, that it has become apparently too much for one coroner (conjointly with the other professional duties with which coronerships are usually accompanied), to give the colliery inquests that amount of attention which they require; and it has occurred to me that the district might be advantageously re-arranged, and an additional coroner appointed.

List of the accidents.

The following is a detailed list of the fatal accidents which have occurred in the whole of my inspection district during the year 1864:—

LIST of the FATAL COLLIERY ACCIDENTS and LOSS OF LIFE arising therefrom in the NORTH and EAST LANCASHIRE or MANCHESTER DISTRICT, under MR. DICKINSON'S Inspection, during the Year 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. Jan. 22	1	Bent Grange	Oldham	Thomas Butterworth	James Lord	Waggoner	19	Burned whilst blasting. The flame caught him as he was getting away; died on the 29th.	–	–	–	1	–
Feb. 5	2	Arley Main	Blackrod	Arley Main Colliery Co.	Ralph Close	Sinker	36	A horse tree, caught by the sinking hoppet in ascending, falling upon him.	–	–	1	–	–
„ 17	3	Dunkenhalgh Park.	Church	Trustees of the late Joseph Barnes.	Robert Nuttall	Miner	35	Roof falling whilst he was drawing props in Dilhall pit; died 5th of April.	–	1	–	–	–
Mar. 4	4	Scholes Fold	Darwen	Executors of John Brandwood.	John Aldcroft	Sinker	50	Falling down the shaft. Being night, a new engineman, in charge of the pumping engine, and who had not previously handled this winding machine, incautiously attempted to do so, and overwound the basket in which deceased was ascending.	–	–	1	–	–
„ 24	5	Clifton Hall	Clifton	Andrew Knowles and Sons	Wm. Chesworth	Miner	20	Burned by an explosion of fire-damp in the Doe mine; died 3rd of April. The men knowing the place to be on the move, incautiously continued at work with open lights, and without reporting it to the under-looker or fireman, until gas came off with the breaking down of the roof.	1	–	–	–	–
„ 28	6	Bank	Little Hulton	John Wright	Henry Mather	Dayman	61	Roof falling. He was taking out a prop in a finished bay in the Trencherbone mine.	–	1	–	–	–
April 1	7	Denton Lane	Hollinwood	Chamber Colliery Company	Henry Dingsdale	Fireman	29	Chain breaking, as he was riding down the incline.	–	–	–	–	1

List of Fatal Colliery Accidents.—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above-ground.
1864. April 18	8	Dootson & Vauze	Blackrod - -	Samuel Leather -	Samuel Hampson -	Hooker-on -	18	Falling out of the Cannel coal mouthing. A cage, apparently, descended upon him as he was leaning out speaking down the shaft.	–	–	1	–	–
„ 26	9	Atherton -	Atherton - -	John Fletcher & others -	Wm. Harrison -	Waggoner -	12	Caught by a full tub waggon escaping down a brow in Gibfield pit; apparently, he was attempting to stop the tub.	–	–	–	1	–
„ „	10	Oak - -	Hollinwood - -	Chamber Colliery Co. -	Wm. Hilton, and James Wright -	Miner - Waggoner -	48 22	Roof stone falling in the Albert pit; being misled by the roof sounding good they did not set sufficient props.	–	2	–	–	–
„ 30	11	Pendlebury -	Pendlebury - -	Andrew Knowles & Sons	Robert Garside -	Dayman -	28	Earth falling in the Rams mine; died in the infirmary.	–	1	–	–	–
May 7	12	Honeywell Lane	Oldham - - -	Booth and Marland - -	James Marland -	Banksman -	–	Falling down the upcast shaft in the night; there was a self-acting fence, but at the time it was raised by the cage into the head-gear.	–	–	1	–	–
„ 13	13	Ladyshore -	Little Lever - -	John Fletcher - -	Joseph Walker -	Waggoner -	17	Struck by a windlass-handle which broke off on being violently turned by a tub-waggon, which he had not securely landed, running back down a brow.	–	–	–	1	–
„ 30	14	Stand Lane -	Radcliffe - -	Stand Lane Colliery Co. -	John Lowe - -	Hooker-on -	15	Coal falling in the Two Yards mine. It fell off to a break (such as are frequently found) at the higher side of the level into which the place was being worked, and which should have been propped.	–	1	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. June 3	15	Hulton	Over Hulton	Hulton Colliery Co.	Andrew Sixsmith	Fireman	29	Suffocated by fire-damp in the Cannel mine at No. 1 Park pit. The gas being explosive he went into the place in the dark.	–	–	–	1	–
„ 6	16	Agecroft	Pendlebury	Andrew Knowles & Sons	William Davis	Miner		Burned by an explosion of fire-damp in the Crumbouke 4 ft. mine; died 21st. The place having been taking weight, liberated some gas which accumulated behind the stowing, and it became lighted at the candle of another miner who was searching there for an oil bottle which he had hid.	1	–	–	–	–
„ 15	17	Ladyshore	Little Lever	John Fletcher	John Sunderland	Assistant banksman	13	Falling down the Victoria shaft from the Doe mine, below which it was being sunk. Apparently he was pushing the landing waggon back and fell past it.	–	–	1	–	–
„ 16	18	Rowley	Burnley	Exors. of John Hargreaves	Joseph Baldwin	Miner	33	Roof falling as he was removing couplings to make place for arching.	–	1	–	–	–
„ 22	19	Edge Fold	Worsley	Bridgewater Trust	Joseph Cook	Ditto	36	Roof falling in the 7 ft. mine; died 12th of July.	–	1	–	–	–
„ 23	20	Pilsworth	Heywood	John Pollitt	Samuel Ogden	Ditto	24	Suffocated by blackdamp. He climed over the fence and was overpowered by the gas coming from old workings.	–	–	–	1	–
„ 29	21	Rose Hill	Bolton	Samuel Scowcroft	Joseph Whittle	Ditto	34	Burned by an explosion of firedamp; died 1st of July. Having cut through into an old working he (instead of stopping up the hole and reporting that he had done so) left the place for a time and then returned with an open light.	1	–	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864.													
July 2	22	Ashton's Field	Little Hulton	Bridgewater Trust	Wm. Ashon	Miner	54	Coal falling upon him in the Trencherbone mine ; died on the 5th.	–	1	–	–	–
" "	23	Duxbury	Chorley	Thos. and Wm. Whittle	James Blackledge	Man	—	Caught between the buffer of two railway waggons, on the siding.	–	–	–	–	1
" 4	24	Clough Side	Outwood	Thos. Fletcher and Sons	Wm. May	Fireman	39	Falling down the shaft when descending. It is supposed that he fell on getting out at a mouthing.	–	–	1	–	–
" 5	25	Pendlebury	Pendlebury	Andrew Knowles and Sons	Jackson Barber	Miner	—	Burned whilst blasting ; died on the 17th. The shot blew out the stemming, which caused the flame to go further than usual.	–	–	–	1	–
" 6	26	Barracks	Little Hulton	Bridgewater Trust	Thos. Garnett	Miner	43	Clod earth falling from the roof of the Black mine.	–	1	–	–	–
" 12	27	Ightenhill	Burnley	Executors of John Hargreaves.	John Nuttall	Miner	42	Breakage of the wire rope, at a rusted place, as he was descending the Broughton shaft. A safety apparatus was attached, and which acted and secured the cage in the shaft, but the deceased was found at the bottom.	–	–	1	–	–
" 14	28	Clifton Hall	Clifton	Andrew Knowles and Sons	Stephen Hardy	Miner	—	Roof falling in the Doe mine	–	1	–	–	–
" 16	29	Denton Lane	Hollinwood	Chamber Colliery Co.	Richard Bowden	Horsekeeper	24	Falling out of the cage from the Black mine mouthing to the bottom as he was descending the shaft.	–	–	1	–	–
" 25	30	Lords Fields	Ashton-under-Lyne	Lords Fields Colliery Co.	Alfred Jacques	Miner	27	Burned by an explosion of firedamp in the Roger mine ; died 25th of September. He and another miner improperly got to the place before the fireman had examined.	1	–	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. July 28	31	Gannow - -	Burnley - -	Exors. of John Hargreaves	John Collinge -	Miner -	58	Roof falling, at two unseen slippery partings, and when propping was omitted.	–	1	–	–	–
„ 29	32	Foggs - -	Darcy Lever - -	Andrew Knowles & Sons	Charles Donolley -	Sinker -	35	A pole falling upon him from the top of the shaft. It slipped diagonally underneath the landing waggon.	–	–	1	–	–
Aug. 3	33	Holebottom -	Oldham - -	Leeses, Jones, & Co. -	Thos. Chadderton	Miner -	45	Roof falling in the Little mine in the Nelson pit. They had omitted building the gobwalling under the roof.	–	2	–	–	–
					Henry Chadderton	Ditto -	21						
„ 23	34	Bridgewater -	Worsley - -	Bridgewater Trust -	James Welsby -	Surface-waggoner.	26	Injured by the breakage of a waggon-wheel; died on the 30th, at the Manchester Infirmary.	–	–	–	–	1
Sept. 3	35	Agecroft - -	Pendlebury - -	Andrew Knowles & Sons	Edwd. Hamer -	Pony-driver	—	Crushed by waggons; died 7th -	–	–	–	1	–
„ 12	36	Chadwick Hall -	Rochdale - -	Roscow & Lord - -	Henry Bloxup -	Miner -	30	Roof falling - - -	–	1	–	–	–
„ 23	37	Linnyshaw -	Worsley - -	Bridgewater Trust - -	Wm. Hayes -	Waggoner -	15	Coal and earth falling from the side of the Bin mine.	–	1	–	–	–
„ 24	38	Dunkenhalgh Park	Church - - -	Trustees of the late Joseph Barnes.	Joseph Holden -	Ditto -	13	Crushed against the roof whilst riding on a waggon up a jig brow.	–	–	–	1	–
„ 26	39	Whittle Field -	Burnley - -	Exors. of John Hargreaves	Jonathan Shepperd	Miner -	—	Stone falling upon him in the level.	–	1	–	–	–
„ „	40	Bank - -	Little Hulton - -	John Wright - -	Joseph Haslam -	Waggoner -	14	A full waggon running against him.	–	–	–	1	–
Oct. 4	41	Bardsley Bridge	Ashton-under-Lyne -	Jonah Harrop & Co. -	John Jones -	Miner -	44	Roof falling in the Foxholes mine	–	1	–	–	–
„ 8	42	Agecroft Bridge	Pendlebury - -	Andrew Knowles & Sons	Wm. Emanuel -	Ditto -	—	The cage descended upon his foot as he was preparing to get out before alighting; died on the 14th, at the Manchester Infirmary.	–	–	1	–	–
„ 10	43	Pendlebury -	Pendlebury -	Andrew Knowles & Sons	Adam Hardman -	Ditto -	—	Earth falling in the Rams mine -	–	1	–	–	–

List of Fatal Colliery Accidents—*continued*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof.	In shafts.	Miscellaneous.	Above ground.
1864.													
Oct. 15	44	Clayton	Manchester	Leigh and Bradbury	James Entwhistle John Johnson	Miner Ditto	40 38	Roof falling in the 4 feet mine.	–	2	–	–	–
„ 17	45	Great Lever	Bolton	Earl of Bradford	William Hall	Ditto	36	Roof coal falling in the 6 feet mine. He went under after cutting the side for taking the coal down.	–	1	–	–	–
„ 19	46	Rossendale	Newchurch	Hargreaves, Ashworth and Co.	Jonathan Clarke	Ditto	22	Stone falling from the roof	–	1	–	–	–
„ 22	47	Foggs	Little Lever	Andrew Knowles and Sons	George Walker	Ditto	33	Burned by an explosion of fire-damp in the Cannel mine; died 2d Nov. He omitted to take a safety lamp on going into an upbrow which had been clear of fire-damp a short time previously.	1	–	–	–	–
„ 28	48	Westleigh	Westleigh	Kirkless Hall Co.	Ralph Hayes	Ditto	25	Coal falling	–	1	–	–	–
„ „	49	Stand Lane	Radcliffe	Stand Lane Colliery Co.	Samuel Wolstencroft.	Dayman	31	Waggons running off the rails in the engine brow.	–	–	–	1	–
Nov. 8	50	Kearsley	Kearsley	Trustees of the late Ellis Fletcher.	Thomas Wallwork	Miner	61	Coal falling in the Trencherbone mine.	–	1	–	–	–
„ 11	51	Haughton	Haughton	Thomas Shaw	Thomas Andrew	Ditto	—	Bin earth falling in the Hard mine; died 18th January 1865.	–	1	–	–	–
„ 12	52	Moston	Manchester	Executors of J. Stanley	John Farrand	Ditto	—	A descending water tank knocked him down the shaft from a mouthing, where the mine had got on fire.	–	–	1	–	–
„ 15	53	Ladyshore	Little Lever	John Fletcher	Thomas Hodgkiss	Sinker	44	A brick falling upon him in the Victoria shaft; died 18th.	–	–	1	–	–
„ 18	54	Waterside	Darwen	Adam Bullough	John Duckworth	Waggoner	13	Stone falling from roof	–	1	–	–	–
„ 29	55	Kearsley	Kearsley	Trustees of the late Ellis Fletcher.	William Rothwell	Miner	—	Coal, &c. falling in the Trencherbone mine.	–	1	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Names.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. Dec. 1	56	Clifton - -	Clifton - - -	Trustees of the late Ellis Fletcher.	Luke Tyldesley -	Miner -	19	Coal falling in the Rams mine, Robin Hood pit.	–	1	–	–	–
„ 9	57	Hulton - -	Over Hulton - -	Hulton Colliery Co. -	Thos. Hampson -	Miner -	17	Stone and earth falling from the roof of No. 13, Three-quarters pit.	–	1	–	–	–
„ „	58	Tyldesley -	Tyldesley - -	Tyldesley Co. (Green, Holland & Co.)	Richd. Owen -	Miner -	31	Falling out of the Crumbouke mouthing in the Common pit shaft, as he was about to ascend.	–	–	1	–	–
„ 14	59	Lord's Fields -	Ashton-under-Lyne -	Lord's Fields Colliery Co.	Wm. Stopford - James Kenyon -	Miner - Miner -	20 –	Coal falling in the Great mine, whilst mining without having sprags set.	–	2	–	–	–
„ 23	60	New Watergate and Peel Hall.	Little Hulton - -	Jas. and Wm. Roscoe -	James Mullineux -	Miner -	–	Roof falling in the Trencherbone mine.	–	1	–	–	–
								Total - - 64	5	33	13	10	3

I have, &c.
JOSEPH DICKINSON,
Inspector of Mines.

The Rt. Hon. Sir George Grey, Bart., G.C.B.,
Principal Secretary of State.

Mr. Higson's Report.

Report of the Working of the Mines Inspection Act (23 & 24 Vict. c. 151.) in the West Lancashire and North Wales District, during the Year ended 31st December 1864.—By Peter Higson, Esq.

Sir, Manchester, February 28th, 1865.

I have the honour to transmit the following report of my proceedings, as Inspector under the Act 23 & 24 Victoria, cap. 151, of the mines of coal, cannel, and ironstone, in the district comprising West Lancashire and North Wales for 1864.

Separate fatal accidents and loss of life in the year 1864.

In the time previously mentioned there happened in and about the mines of coal and cannel, within the district to which these observations refer, 91 separate fatal accidents which caused the death of 110 persons, and in the mines of ironstone of the coal measures one fatal accident only occurred, resulting in the death of one person.

Separate fatal accidents in 1863 and 1864.

In the year 1863 there were 87 separate fatal accidents in the mines of coal and cannel of the same district by which 106 lives were lost, and in the mines of the ironstone of the coal measures only one fatal accident and one death took place. The return for 1864 therefore shows an increase of four in the number of separate fatal accidents, and of four also in the number of lives lost.

Classification of the separate fatal accidents and loss of life.

Of the separate fatal accidents which are herein-after more particularly described, 7 causing the death of 10 persons occurred from explosions of gas; 40 which caused the death of 43 persons from falls of roof and falls of coal; 22 which caused the death of 28 persons, from falling into or things falling upon them in shafts; 12 which caused the death of 19 persons below ground from explosions of gunpowder, suffocation by gases, irruptions of water, falling into water upon inclined planes, and by coming in contact with trams and tubs; and 10 which caused the death of 10 persons from miscellaneous causes above ground, and one which happened in an ironstone pit through the deceased falling out of the ropes and chains by which he was descending.

Number of Mines or Collieries and working and pumping pits or shafts.

On the mines or seams of coal, cannel coal, and ironstone within my district, there are 180 collieries or ironstone works, each comprising two or more shafts or other entrances thereto, and five pits or works with one shaft only, which in the aggregate amount to 400 winding and pumping pits or shafts, exclusive of those which are used only for ventilation, and they vary in depth from 90 to 1,800 feet, and in diameter from 7 to 16 feet.

Estimated quantity of coal, cannel coal, and ironstone got and raised in 1864.

I estimate the quantity of coal and cannel got and raised in the year 1864 at 7,500,000 tons, and of ironstone 54,000 tons, and I find from the census return made that in the year 1861, 18,302 males of all ages were employed in and about the mines of coal and cannel coal, and 268 in the ironstone mines of the coal measures under inspection.

Estimated get of coal in West Lancashire and number of persons employed.

Estimated get of coal, &c. and ironstone in North Wales and number of persons employed.

I estimate also 5,750,000 tons of the annual produce of the mines of coal and cannel coal of the district to have been got and raised in West Lancashire, wherein I find 18,239 males of all ages have been employed for that purpose, and that 1,750,000 tons besides 54,000 tons of ironstone have been got and raised in North Wales, wherein 6,063 males of all ages have been employed in and about the mines of coal, and 268 in getting and raising ironstone. The average out turn of coal therefore in West Lancashire for the year 1864 has been equal to 314 tons, and in North Wales to 272 tons for every person employed, while that of ironstone estimated in like manner amounts to 201·40 tons. But the ironstone having in some places been worked simultaneously with the coal mines, this should be viewed only as an approximate return of the quantity got in the year for each male person employed. These results show that one male person out of every 267 employed in the district has met with a fatal accident, and that one out of 221 has been killed; that for every separate fatal accident 82,417 tons of coal and cannel have been got and raised, and that for every 68,181 tons of coal and cannel got and raised one life has been lost.

Number of persons employed in and

Several circumstances may contribute to account for the difference of the number of persons employed in the mines of the district existing between the Census tables of 1861 about the mines.

and the actual return made by the owner or agent of each mine in 1863, which amounts to 27,600. A considerable increase would not only take place in the interval between the date of the former and that of the latter, but there is some difficulty also in extracting from the Census the exact number, in consequence of the Inspection districts comprising in some instances a portion only of a Census district. It is also likely that a large number of persons who are employed above ground in and about the mines of the district may have returned themselves for the Census as labourers only, while in reality many of them act as banksmen and others attend to the screening and dressing of the coal and in moving the railway trucks to and from the loading places at the pit bank. When fatal accidents have happened to persons so employed I have always returned them as accidents that have occurred in and about the mines or collieries pursuant to the requirements of the Act.

Increase and extension of Mines or Collieries.

Although in some instances mining operations have been singularly unfortunate in various parts of the district within the period under consideration, in which many casualties have happened for which a parallel can scarcely be found, while similar events may never again occur. It is however evident that those of an ordinary kind, such as are common to, and in many cases almost unavoidable from the very hazardous character of the occupation are very numerous, and have caused great loss of life. If it be imagined that these also should be gradually diminished until the loss of life has been brought to a minimum quantity or very much below anything hitherto recorded. That I fear is not likely to be realized so long as the present rapid extension of works and increase of the mining population continue with such unabating activity. Still it is satisfactory to find that notwithstanding these numerous, unusual, and untoward events, there were no more separate fatal accidents in the last than there were in the first year of my taking charge of the district (1856), and only a slight increase of the loss of life. During that time about 80 new collieries have been made and established, and most of those previously existing have been enlarged and very much improved, whereby the output or get of coal has been augmented by 70 per cent., while the number of persons from time to time employed in and about the same has been increased in a corresponding ratio. It is therefore clear that a much greater quantity of coal was got for the occurrence of each separate fatal accident and for the loss of each life in the year 1864 than in the year 1856. Although these results fail to realize the hope I have so long entertained and so frequently expressed, they are far from being unsatisfactory. They show, when carefully considered, a very large diminution of accidents and of loss of life in proportion to the number of persons employed and the quantity of coal got and raised in the district, and while it is much to be desired, it may be also reasonably expected that a still greater diminution will subsequently take place.

Duties attended to.

In making careful investigations of the causes from which accidents fatal and non-fatal have followed, and in attending inquests on the deceased persons, much of my time has been occupied. These inquiries have involved in most instances a minute inspection of the workings below ground, by which I have been able to prevent not only similar casualties there, but frequently others that might have proved equally or perhaps more destructive to life; and from the evidence generally obtained at coroner's inquests great facilities for efficient underground inspection may be derived.

Opinions, I find, differ as to the best mode of inspection or of carrying out the Act; some persons argue that constant and periodical supervision of the mines should be made at short intervals, and prior to the occurrence of accidents; others maintain, and perhaps with more force and better judgment, that such a system of inspection would cause the managers and underlookers to feel relieved in some degree of responsibility, and that if the visits below ground of an Inspector were to be made more frequently, those of the manager would naturally become fewer, and that while the former would be almost looked upon as taking a part in the supervision of the works the latter only would have proper control of the ways and means.

Meeting of miners' agents at Leeds.

At the annual gathering of the miners' delegates at Leeds in 1863, the present system of inspection was subsequently reported to have been then and there discussed. At that meeting two important points, among many others, seem to have been settled unanimously, namely, that the Inspectors of mines had far too much work to do, and that they neglected to do that to which it was their duty to attend, and that nothing could supply proper and efficient inspection but the appointment of a number of practical miners to act as sub-inspectors. The substance of these resolutions may be gathered from the above, which was still further illustrated by subsequent speakers, who after indulging in a few ill-natured remarks on some of my colleagues, one of them stated that "the Inspector for North Wales never went further than the bottom of the pit." I wrote at the time to the person who made this statement to name a single instance when and where such a circumstance took place, but the information I then sought has not yet been supplied. I had therefore concluded that it was unworthy of further notice. I felt convinced that every person who has paid strict attention to such matters must be satisfied from the information I have supplied at coroner's inquests, and the evidence I have given at those inquiries, nearly all of which I have attended, that the accusation had no foundation in truth. But as a similar charge against the Inspectors of mines generally recently appeared in the "Mechanics Magazine," and subsequently in the leading provincial newspapers; and as the source from which it issued is supposed to comprise the representatives of the workpeople and to be well informed, I believe that under the circumstances it would not be to the interest of any one to allow the charge to remain any longer uncontradicted. I therefore take the opportunity of informing you that I cannot call to recollection any occasion on which I returned from an underground inspection without going into the workings of the mine and ascertaining the state thereof, neither do I believe that such a thing ever transpired with me, and although it may be necessary for an Inspector to go to the bottom of a pit or shaft for some special object and to return without going through the workings, that would not be often repeated. I have also to observe that there is not in the whole of North Wales more than one colliery which has been in operation three months that I have not made myself acquainted with by an inspection both above and below ground.

To lay down any mode or fixed rule for the inspection of mines, which could be strictly carried out in practice, appears to me almost impossible. The system must of necessity be subservient to circumstances. There are some mines in which there appears to be little or no danger and in which a life, except by a most unusual and accidental event, ought never to be lost. In others, on the contrary, it exists to an alarming degree and in many instances to an almost unmanageable extent. It is sometimes conspicuously developed, while occasionally it is latent and not easily discovered except by engineers and viewers of skill and experience until it is too late to prevent loss of life.

After having attended to the duties herein previously described, my attention has been principally devoted to mines of the class last mentioned.

I have frequently, while making an inspection of one colliery, gleaned information and knowledge of the risk to which another colliery was evidently liable, and, in all probability, thereby prevented many casualties. I have caused the ventilation of many collieries, which from the workings having been extended had become defective, to be improved and made safe; and although the result fails to realize my expectations, I am still of opinion that through these exertions considerable improvement will be subsequently apparent.

With labour of this description, comprising constant personal inspection both above and below ground, in attending inquests, and to my official correspondence, I have had no difficulty in finding full occupation; and while the most dangerous mines have had the largest share of my attention, I have not been unmindful of others. These services have not been rendered in a measured, niggardly, or selfish manner, but with a full sense of the importance of doing my duty; and there can be no greater fallacy than to suppose that practical miners are more fitted for, or that they would ever discharge the duties of underground inspection so thoroughly and efficiently as persons who have been brought up to, and distinguished themselves in, some degree as mining engineers or viewers of mines.

Inadequate assistance rendered by the workpeople.

It is somewhat remarkable that notwithstanding I have to report 91 fatal accidents and 110 deaths for the year under review, I received no information beforehand of any kind whatever apprising me that danger existed or that irregularity was practised at any of the places where these lives were lost. Neither have I received more than four letters during the said year drawing my attention to an unsatisfactory state of things. As I have so often expressed both to the managers of works, practical miners, and their agents, that I hold myself in readiness to come to their relief at any hour either by day or night upon receiving notice of anything being in a state unfit for the workpeople to enter the mine, this reticence shows the want of proper co-operation and absolutely an unbecoming disregard of the means and efforts that have been devised and made for their welfare and protection. One would have thought that the hands of an Inspector would have been filled almost daily with letters from those who had cause of complaint and that such communications would have proceeded from the workpeople only; but so far from that having been the case, I have found on the contrary most of the information that has voluntarily reached me has been sent by the owners and managers of mines; I am therefore of opinion, which has been formed after mature deliberation, that the workpeople themselves do not take sufficient interest in the cause of the inspection of mines. They neglect to co-operate in preventing accidents, and they are as a rule reckless in the presence of danger. The former may be occasioned by their having to follow a very laborious occupation, and the latter from their being so frequently surrounded by risks of various kinds as to become from habit indifferent to the consequences that might occur. But ignorance in some instances and the lamentable vice of drunkenness in others are the prevailing elements of obstruction to greater progress. Disputes also between the workpeople and their employers, resulting in the stint (as it is locally termed) and frequently in partial strikes, are often the direct means not only of damaging the position of the workpeople themselves, but of causing accidents of various kinds to occur; generally extra hands are employed on such occasions to maintain the get of coal, who are neither acquainted with the occupation, nor capable of taking care of themselves. The names of several of that class who were recently employed in various parts of the district are now included in the list of fatal accidents hereunto annexed.

Schools and education in Lancashire.

At the largest collieries in West Lancashire the means of acquiring education has been well provided by the owners. At one colliery alone nearly 2,000*l.* has been expended in the erection of large and commodious schools, and a sufficient number of competent teachers are constantly engaged there. At another colliery of still greater extent the proprietor, who is the owner also of a large estate, has at his own expense erected three schools for the education of the children of his workmen, these also are well regulated and under able supervision. Adjoining a colliery of considerable magnitude the lessor of the mines has built a large and most elegant school, which any child may attend. At these and numerous other schools the teaching and regulations are all that could be desired, at an expense varying from one penny to threepence per week. Boys employed at smaller collieries are seldom located far from a school, still upon the whole the attendance in almost every instance that has come under my notice has hitherto been irregular and unsatisfactory. In consequence of this, coupled with the difficulties attending certificates, the owners of several collieries now prohibit the employment of boys below ground under the age of 12 years. But as they are principally engaged by the colliers themselves as drawers, they are frequently taken into the pit at an earlier age where they escape detection, until perhaps they have attained the proper age. On several occasions I have had to complain of the employment of boys, said to be 12 years of age and upwards, without a certificate having been first obtained to that effect; but in each case the boy's parents were not able to pay the registrar's fees, which I was informed amounted to more than 3*s.* 8*d.*; subsequently however a baptismal register has been obtained at a much less cost.

Ditto in North Wales.

In North Wales the provisions already made for affording education are not so extensive as in Lancashire, although they are sufficient for the purpose; neither is the attendance at school of boys under the age of 12 years who can neither read nor write any better observed. It is difficult for them to comply with that enactment of the statute. There are many excellent schools in North Wales, and upon the whole education may be acquired at a moderately cheap rate; but there are very few belonging to the owners of mines. They have been built principally by public subscriptions, and in some instances by benevolent persons, and they are open on the payment of a small weekly sum to all comers.

To make the following accidents and loss of life better understood, some further observations may be necessary. Of the number returned in the following list there are many that have happened entirely from the carelessness of the sufferers themselves. A large number from circumstances over which human exertions seem to have no control, and some which require a great deal of explanation.

Accident No. 37.

On the 24th of June, James Bently, aged 13 years, employed on a pit bank at Aspull, belonging to the Earl of Crawford and Balcarres, accidentally pushed a tub into the pit or shaft and fell in along with it. They fell upon the ascending cage in which the deceased Noah Seddon was riding. He was knocked out and found at the bottom quite dead.

Accident No. 39.

On the 1st of July an accident causing the death of six persons happened in the Marsh's Delf pit at Blackley Hurst, near St. Helen's, belonging to Mr. Samuel Stock. They were descending the pit in one cage, which, in consequence of the wood guide rods having shrunk, got loose, and by swinging about out of the perpendicular line came in collision with the ascending cage of other rope. The two cages were working in the same pit with a limited space between them. These unfortunate persons were precipitated to the bottom, and subsequently taken up dead.

Accident No. 46.

The deceased, in this instance, was suffocated by white damp, which issued from the joints of a rock in a sinking pit in Aspull in which air pipes had just been placed to improve the ventilation. Deceased was an enginewright, not employed in the pit, but on the surface. He went down the pit out of curiosity to see if the pipes were acting properly.

Accident No. 76. This accident was caused by a sudden issue of gas from the roof of a mine in a waggon road alongside of a fault at Mancot Colliery, near Chester, and resulted in the death of three persons and injury to two others. The place had been examined not long before and found to be perfectly safe. A fall or breaking of the roof is supposed to have liberated the gas. Uncovered lights were then used throughout the mine.

Accident No. 85. On the 15th of December an influx of water caused the death of eight persons in the main coal seam of the Leeswood Main Colliery, near Mold, belonging to Messrs. Craig, Taylor, and Craig. The workings in which this casualty occurred are about 30 yards in perpendicular depth below the level of the bottom of the shaft and are approached from that point by a down brow or engine plane towards the south. The goaf from which the water issued was made by the present proprietors, very recently, and was known to be full of water. It extended alongside of the present workings for some distance, from which it was separated by a barrier of an unworked portion of the mine, and a small fault or throw which breaks the continuity of the mine (which is nine feet thick) about seven feet and a half. The plan of the colliery, on which all their underground operations were supposed to be shown, had been prepared by a competent person, but from circumstances then existing one portion of the plan only was prepared from actual survey, the remainder being made up from information supplied by a previous underlooker. This plan, a copy of which I have annexed, shows the fault to be nearer the old workings by many yards than where it has now been proved to exist.

It was stated in evidence at the inquest that when the recent working touched the fault, those in charge of the management of the mine thought there were two faults in their front, which, had that been so, would have been quite sufficient to hold back the water. It appears, however, to have been cut and explorations carried very much beyond it, relying, as it was stated, on there being a second fault for protection until the leading working places were, according to their own plan, within a few yards of the goaf, without boring in advance and on each side thereof. As it was known that the fault had been bared on the side next to the goaf, it would not have effectually held back the water as the thickness of the mine exceeded the break or throw of the fault, consequently boreholes should have been made pursuant to the provisions of the 15th General Rule of the Act for the Regulation of Mines as the workings gradually advance in that direction.

There were other unmistakeable indications also of irregular, I may say bad management below ground sufficient to convince one that the manager had not paid proper attention to his business, nor to the safety of the workpeople; there are, however, two circumstances connected with this deplorable event, which, in some degree relieve him of the full weight of this heavy charge. His own son, who was working in one of the most remote places, was only saved by making his way through the water, and he himself had frequently been through the working a very short time before.

After a long inquiry the jury returned a verdict of manslaughter against the three partners, Messrs. Craig, Taylor, and Craig, and this indictment will have to be heard at the approaching assizes at Mold. The plan No. 1. is a copy of so much of the plan of the colliery workings up to the time of the casualty, as I find necessary to explain this matter. The plan No. 2. has been prepared from an actual survey which has been made since the water broke in.

Accident No. 89. This was a case of negligent winding, in which the engineer narrowly escaped being indicted for manslaughter. It occurred in the night at the High Brook Colliery near Wigan, when the two unfortunate men were descending to their work after supper. By some mistake or negligence the engineer gave the engine more steam when it required less, and by mismanaging the valves, it was put on the wrong side of the engine, so that it acquired an uncontrollable velocity, which caused the cage to break through the scaffold, and the deceased to fall into the pit below, from which their bodies were subsequently recovered.

I have, &c.,
(Signed) Peter Higson.

The Right Honourable
Sir George Grey, Bart., G.C.B.,
Her Majesty's Secretary of State, Whitehall.

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS OF LIFE arising therefrom, in the WEST LANCASHIRE and NORTH WALES DISTRICT, during the Year ended December 31, 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. Jan. 2	1	Croppers Hill	St. Helen's	James Radley	John Marsh	Collier	51	An explosion of gas in Rushy Park mine.	1	–	–	–	–
,, 6	2	Haydock	Ditto	Richard Evans and Co.	Margaret Knowles	Labourer	–	Crushed by a loaded coal truck on the surface.	–	–	–	–	1
,, ,,	3	Holme House	Ditto	Ra. Rimmer	James Talbot	Do.	24	Falling into water at the pit eye	–	–	1	–	–
,, ,,	4	Haydock	St. Helen's	Richard Evans and Co.	John Hulme	Drawer	18	Fall of roof	–	1	–	–	–
,, 21	5	Vron	Wrexham	Maurice and Low	Thomas Price	Banksman	–	Falling into shaft from surface	–	–	1	–	–
,, 23	6	Strangeways	Wigan	William Hayes	William Rylands	Collier	–	An explosion from a shot	1	–	–	–	–
,, 30	7	Haydock	St. Helen's	Richard Evans and Co.	Thomas Knowles	Do.	–	Fall of roof	–	1	–	–	–
,, ,,	8	Barley Brook	Wigan	Pearson and Knowles	Robert Cheetham	Do.	–	Ditto	–	1	–	–	–
Feb. 12	9	Hammer Colliery	Mostyn, Flintshire.	Eyton and Elliott	John Robert	Do.	–	Ditto	–	1	–	–	–
,, 20	10	Halsnead	Prescot	Daniel Willis	William Rimmer	Drawer	14	Fall of coal from the top of the pit	–	–	1	–	–
,, 23	11	Coppa	Mold	Griffiths, Brother	Edwin Wyme	Sinker	–	An explosion of gas	1	–	–	–	–
Mar. 1	12	Haigh	Wigan	Earl of Crawford and Balcarres.	William Atkinson	Breaksman	–	Crushed on the surface railway between two loaded coal trucks.	–	–	–	–	1
,, ,,	13	Ruabon	Ruabon	Ruabon Coal Company	Thomas Williams	Drawer	13	Run over by a pit box in the yard coal mine.	–	–	–	1	–
,, 8	14	Holland	Wigan	Earl of Crawford and Balcarres.	Edwin Gaskill	Collier	30	Fall of coal	–	1	–	–	–
,, 18	15	Bickershaw	Ditto	Ackers, Whitley, and Co.	John Cubbin	Do.	48	Injuries inflicted by a capstan rope	–	–	1	–	–
,, ,,	16	Wynnstay	Ruadon	New British Iron Company	James Blackwell	Sinker	–	The bucket in a sinking pit falling upon him.	–	–	1	–	–
,, 23	17	Haydock	St. Helen's	Richard Evans and Co.	James Morriss	Drawer	19	Fall of roof	–	1	–	–	–
April 2	18	Victoria	Rainford, St. Helen's.	Walmsley Mill and Company.	John Cockrom	Collier	–	Run over in a jig brow by a loaded box.	–	–	–	1	–
,, 6	19	Ladies Lane	Hindley, Wigan	Thomas Gidlow	John Waring	Underground labourer.	–	Fall of roof while setting props	–	1	–	–	–
								Carried forward	3	7	5	2	2

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
								Brought forward -	3	7	5	2	2
1864 April 18	20	Bromfield -	Mold - -	Broomfield Hall Company.	Jno. Evans - -	Underground labourer.	5	Deceased had his leg broken by a tram and died from the effects.	–	–	–	1	–
„ 22	21	Rainford - Do. -	St. Helen's - Do. - -	Ramford Coal Company - Ditto - -	Henry Cottam - Peter Cottam -	Collier - Drawer -	– –	Fall of roof or top coal - - Ditto - - - - - -	– –	1 1	– –	– –	– –
„ 23	22	Orrell - -	Wigan - -	W. H. Brancker - -	Peter Pennington -	Trapper -	12	Deceased fell from a mouthing -	–	–	1	–	–
„ 25	23	Pemberton House	Richard Charnock, near Chorley.	James Barker - -	Roger Hamson -	Collier -	30	An explosion of gas - - -	1	–	–	–	–
„ 27	24	Bickershaw - Do. -	Wigan - - Do. - -	Ackers, Whitley, and Co. Ditto - -	Nathl. Yates - James Hooker -	Ditto - Horse driver	38 13	Fall of stone from the roof - - Ditto - - - - -	– –	1 1	– –	– –	– –
May 5	25	Wynnstay -	Ruabon - -	New British Iron Company	John Price - -	Collier -	–	Ditto - - - - -	–	1	–	–	–
„ 7	26	John Pit Standish.	Wigan - -	Standish and Shevington Cannel Company.	Jas. Greenhalgh -	Drawer -	13	Fall of roof - - - - -	–	1	–	–	–
„ 14	27	Ince Hall -	Do. - -	Ince Hall Coal and Cannel Company.	Ralph Seddon -	Labourer on the surface.	–	Deceased was crushed between the buffers of two coal trucks on the surface.	–	–	–	–	1
„ 16	28	Birket Bank -	Do. - -	Crompton and Shawcross	Jno. Eccleston -	Collier -	44	Fall of coal from the face - -	–	1	–	–	–
„ 17	29	Kirkless Hall -	Do. - -	Kirkless Hall Coal and Iron Company.	Jas. Scotson -	Ditto -	–	Fall of coal - - - -	–	1	–	–	–
„ 26	30	No. 18. Delf -	Ruabon - -	New British Iron Company	Wm. Williams -	Horse driver	14	Ditto - - - - -	–	1	–	–	–
„ 31	31	Winstanley -	Wigan - -	Meyrich Banks - -	Hy. Topping -	Furnaceman	61	Falling from a mouthing in the Mountain pit.	–	–	1	–	–
June 10	32	Hanmer Colliery	Mostyn, Flintshire.	Eyton and Elliot - -	Jno. Roberts -	Banksman -	54	Falling into the shaft from the surface.	–	–	1	–	–
„ 13	33	Moss - .	Wigan - -	Pearson and Knowles -	Wm. Hesketh -	Sinker -	–	Falling out of the tub while descending the pit.	–	–	1	–	–
„ 15	34	Laffak - -	St. Helen's -	J. and J. Johnson - -	Wm. Forster -	Bank rider -	28	Falling off a train in an engine plane	–	–	–	1	–
„ 22	35	Pemberton -	Wigan - -	Jon. Blundell and Sons -	Francis Green -	Breaksman	22	Run over on the Colliery Branch Railway above ground.	–	–	–	–	1
„ „	36	Ince Hall -	Do. - -	Ince Hall Coal and Cannel Company.	Michael Murry -	Collier -	33	Fall of roof - - - - -	–	1	–	–	–
								Carried forward -	4	17	9	4	4

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost. Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864.								Brought forward -	4	17	9	4	4
June 24	37	Haigh - -	Wigan - -	Earl of Crawford and Balcarres.	Josh. Bentley -	Labourer - -	13	Falling into the shaft from the surface.	–	–	1	–	–
		Ditto - -	Ditto - -	Ditto - - -	Noah Seddon -	Drawer -	14	Deceased was knocked out of the cage by a tub falling down whilst he was ascending the pit.	–	–	1	–	–
„ 29	38	Kirkless Hall -	Ditto - -	Kirkless Hall Co. - -	Will. Griffiths -	Ditto -	13	Fall of roof - - - - -	–	1	–	–	–
July 1	39	Blackleyhurst -	St. Helen's -	Samuel Stock - -	Edwd. Clark -	Collier -	30	A collision of the cages in the pit whilst they were descending. It was afterwards discovered that one of the cages had accidentally got out of the guide rods.	–	–	1	–	–
		Ditto - -	Ditto - -	Ditto - - -	Robt. Hulton -	Ditto -	25		–	–	1	–	–
		Ditto - -	Ditto - -	Ditto - - -	John Simpkin -	Drawer -	15		–	–	1	–	–
		Ditto - -	Ditto - -	Ditto - - -	Thos. Heyes -	Ditto -	14		–	–	1	–	–
		Ditto - -	Ditto - -	Ditto - - -	Isaac Simpkin -	Ditto -	12		–	–	1	–	–
		Ditto - -	Ditto - -	Ditto - - -	Henry Burrows -	Ditto -	15		–	–	1	–	–
„ 3	40	Gerards Bridge	Ditto - -	Caldwell and McCormack	Wm. Parr - -	Collier -	46	Fall of top coal - - -	–	1	–	–	–
„ 4	41	Blackbrook -	Ditto - -	Bromilow, Brother, and Co.	Jas. Penketh -	Labourer -	31	Looking out of the cage whilst ascending the pit.	–	–	1	–	–
„ 10	42	Rose Bridge -	Wigan - -	Case and Morris - -	Jas. Hunter - -	Collier -	70	Fall of coal - - - - -	–	1	–	–	–
„ 12	43	Bickerstaffe -	Ormskirk - -	Bromilow, Brother, and Co.	Richd. Eccleston -	HorseDriver	13	A tub falling upon him out of the cage.	–	–	1	–	–
„ 15	44	Kirkless Hall -	Wigan - -	Kirkless Hall Co. - -	Richd. Hamson -	Collier -	–	Falling out of the cage whilst descending pit.	–	–	1	–	–
„ 19	45	Ince Hall -	Ditto - -	Ince Hall Coal and Cannel Company.	Wm. Cromwell -	Collier -	–	Fall of roof - - - - -	–	1	–	–	–
„ 22	46	Haigh - -	Ditto - -	Earl of Crawford and Balcarres.	Jas. Green - -	Labourer -	–	Suffocation by non-explosive gas -	1	–	–	–	–
„ 23	47	Prospect Standish	Ditto - -	Standish and Shevington Cannel Company.	Charles Bates -	Ditto -	21	Falling from the mouthing - -	–	–	1	–	–
„ 26	48	St. Helen's -	St. Helen's -	Messrs. Pilkington -	Danl. Wynne -	Collier -	–	Fall of roof - - - - -	–	1	–	–	–
Aug. 1	49	Ince Hall -	Wigan - -	Ince Hall Coal and Cannel Company.	John Sandforth -	Labourer -	–	Ditto - - - - -	–	1	–	–	–
„ 2	50	Ditto - -	Ditto - -	Ditto ditto -	James Ainscough -	Collier -	–	Ditto - - - - -	–	1	–	–	–
								Carried forward -	5	24	21	4	4

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
							–	Brought forward	5	24	21	4	4
1864. Aug. 2	51	Ravenhead	St. Helen's	Bromilow, Haddock, and Company.	Griffith Wynne	Drawer	–	Fall of roof	–	1	–	–	–
" 8	52	Ruabon	Ruabon	Ruabon Coal Company	Cuth. Richards	Labourer	–	Falling into the machinery	–	–	–	–	1
" 11	53	Albion & Stone House.	Hindley, Wigan	Hindley Coal Company	James Ball	Banksman	40	Falling into the shaft from the surface.	–	–	1	–	–
" 12	54	Blackley Hurst	St. Helen's	Samuel Stock	William Halagan	Labourer	30	Fall of roof	–	1	–	–	–
" 19	55	Kirkless Hall	Wigan	Kirkless Hall Coal Company.	Thomas Grundy	Breaksman	20	Run over by a railway truck	–	–	–	–	1
" 20	56	Prospect	Standish, Wigan	Standish and Shevington Cannel Company.	Henry Tatteson	Labourer	25	Fall of stone from the side	–	1	–	–	–
" 22	57	Bickershaw	Wigan	Ackers, Whitley, and Company.	John Hill	Engineman	38	Falling from a scaffold on the surface.	–	–	–	–	1
" 30	58	Orrell	Ditto	W. H. Brancker	John Gore	Miner	40	Fall of stone from the side	–	1	–	–	–
" 31	59	Standish	Ditto	John Taylor and Son	Thomas Lloyd	Engineman	50	From being scalded in a steam boiler.	–	–	–	–	1
Sept. 8	60	Laffak	St. Helen's	J. and J. Johnson	John Cook	Underlooker	–	Deceased fell from a mouthing in the pit.	–	–	1	–	–
" 14	61	Haigh	Wigan	Earl of Crawford and Balcarres.	Henry Carvin	Labourer	–	Fall of roof	–	1	–	–	–
" 15	62	Barley Brook	Ditto	Pearson and Knowles	Phillip McDermot	Collier	–	Ditto	–	1	–	–	–
" 20	63	Bromfield	Standish, Wigan	Thomas Stone	John Darbyshire	Drawer	19	Suffocation in choke damp	1	–	–	–	–
" 22	64	Welch Whittle	Near Chorley	James Darlington	William Turner	—	40	Falling into shaft from surface	–	–	1	–	–
" 29	65	Blackley Hurst	St. Helen's	Samuel Stock	William Mellor	Sinker	–	An explosion of gas in a sinking pit	1	–	–	–	–
Oct. 4	66	Bromfield	Standish, Wigan	Thomas Stone	Thomas Woodcock	Drawer	16	Fall of roof	–	1	–	–	–
" 8	67	Ladies Lane	Hindley, Wigan	Thomas Gidlow	James Unsworth	Ditto	–	Fall of coal from the face	–	1	–	–	–
" 7	68	Brynn Hall	Ashton, Wigan	Smith and Company	Thomas Hughes	Collier	45	Suffocation by explosive gas	1	–	–	–	–
" 10	69	Peasley Cross	St. Helen's	Bownes and Company	Thomas McKann	Drawer	16	Crushed by trams below ground	–	–	–	1	–
" 11	70	Vron	Wrexham	Maurice and Low	John Griffiths	Collier	25	Fall of coal at the face	–	1	–	–	–
" 18	71	Laffak	St. Helen's	J. and J. Johnson	Robert Barlow	Ditto	25	An explosion	1	–	–	–	–
" 22	72	Northop Hall	Near Flint	Northop and Dublin Coal Company.	Daniel Jones	Ditto	–	Fall of roof	–	1	–	–	–
								Carried forward	9	34	24	5	8

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost. Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864.								Brought forward	9	34	24	5	8
Oct. 29	73	Pemberton	Wigan	Jonathan Blundell	Elijah Banks	Labourer	22	Run over on railway above ground	–	–	–	–	1
Nov. 2	74	Haigh	Ditto	Earl of Crawford and Balcarres.	Richard Hardman	Collier	40	Fall of roof	–	1	–	–	–
,, 14	75	Brynkmalt	Chirk, Denbighshire.	Brynkmalt Coal Company.	Benjamin Williams	Ditto	24	Ditto	–	1	–	–	–
,, 15	76	Great Mancot	Hawarden Flintshire.	Rose and Plant	Richard Hartley	Ditto	24	An explosion	1	–	–	–	–
		Ditto	Ditto	Ditto	Richard Jones	Ditto	22	Ditto	1	–	–	–	–
		Ditto	Ditto	Ditto	Richard Hughes	Ditto	48	Ditto	1	–	–	–	–
,, 19	77	Park Lane	Wigan	Mercer and Evans	John Orrell	Ditto	–	Fall of roof	–	1	–	–	–
,, ,,	78	Low Hall	Ditto	Moss Hall Company	Peter Tyrer	Ditto	23	Run over on the branch railway above ground.	–	–	–	–	1
,, 24	79	Haydock	St. Helen's	Richard Evans and Co.	John Battersby	Ditto	–	Fall of coal	–	1	–	–	–
,, 30	80	Coed Talon	Mold	Coed Talon Colliery Company.	Enock Edwards	Labourer	21	By jumping out of the cage when it was in motion.	–	–	1	–	–
Dec. 6	81	Pemberton	Wigan	Jonathan Blundell	John Banks	Collier	49	Fall of roof	–	1	–	–	–
,, 7	82	Wynnstay	Ruabon	New British Iron Company.	Jonathan Valentine	Ditto	–	Ditto	–	1	–	–	–
,, 9	83	Greenslate	Wrightington Wigan.	Greenslate Colliery Company.	John Lucas	Ditto	33	Falling out of the cage while descending the pit.	–	–	1	–	–
,, 12	84	Ince Hall (old)	Wigan	Robert James and Co.	Thomas Winstanley	Banksman	–	Falling into the shaft from the surface.	–	–	1	–	–
,, 15	85	Leeswood Main.	Mold	Craig Taylor and Craig	John Jones	Collier	19	An irruption of water	–	–	–	1	–
		Ditto	Ditto	Ditto	John Smith	Ditto	22	Ditto	–	–	–	1	–
		Ditto	Ditto	Ditto	William Jones	Ditto	23	Ditto	–	–	–	1	–
		Ditto	Ditto	Ditto	John Roberts	Ditto	23	Ditto	–	–	–	1	–
		Ditto	Ditto	Ditto	John Jones	Ditto	18	Ditto	–	–	–	1	–
		Ditto	Ditto	Ditto	Thomas Ellis	Driver	15	Ditto	–	–	–	1	–
		Ditto	Ditto	Ditto	Owen Jones	Water fitter	10	Ditto	–	–	–	1	–
		Ditto	Ditto	Ditto	Lewis Lloyd	Daywage-man.	47	Ditto	–	–	–	1	–
								Carried forward	12	40	27	13	10

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
								Brought forward	12	40	27	13	10
1864. Dec. 17	86	Rose Bridge	Wigan	Case and Morriss	Thos. Harrop	Pony driver	18	Run over by a train of trams	–	–	–	1	–
„ 20	87	Leeswood Main	Mold	Craig, Taylor, and Craig	John Pierce	Collier	–	Fall of roof and coal	–	1	–	–	–
„ „	88	Ruabon	Ruabon	Ruabon Coal Company	David Thomas	Ditto	–	Ditto	–	1	–	–	–
		Do.	Do.	Ditto	Wm. Roberts	Ditto	–	Ditto	–	1	–	–	–
„ 21	89	High Brooks	Wigan	Mercer and Evans	Stephen Webster	Ditto	–	Overwinding	–	–	1	–	–
		Do.	Do.	Ditto	Robt. Pilling	Ditto	–	Ditto	–	–	1	–	–
„ 27	90	Westminster	Wrexham	Westminster Coal Company	Will. Griffiths	Ditto	–	An explosion of gas	1	–	–	–	–
„ „	91	Do.	Do.	Ditto	Ishmael Davies	Drawer	–	Ditto	1	–	–	–	–
								Total in coal mines	14	43	29	14	10

IN IRONSTONE MINES.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. Jan. 7	28	Paul Twilt	Minera, Wrexham	Thos. Williams	Robt. Jones	Stone getter	–	Falling out of the chains while descending the pit.	–	–	1	–	–

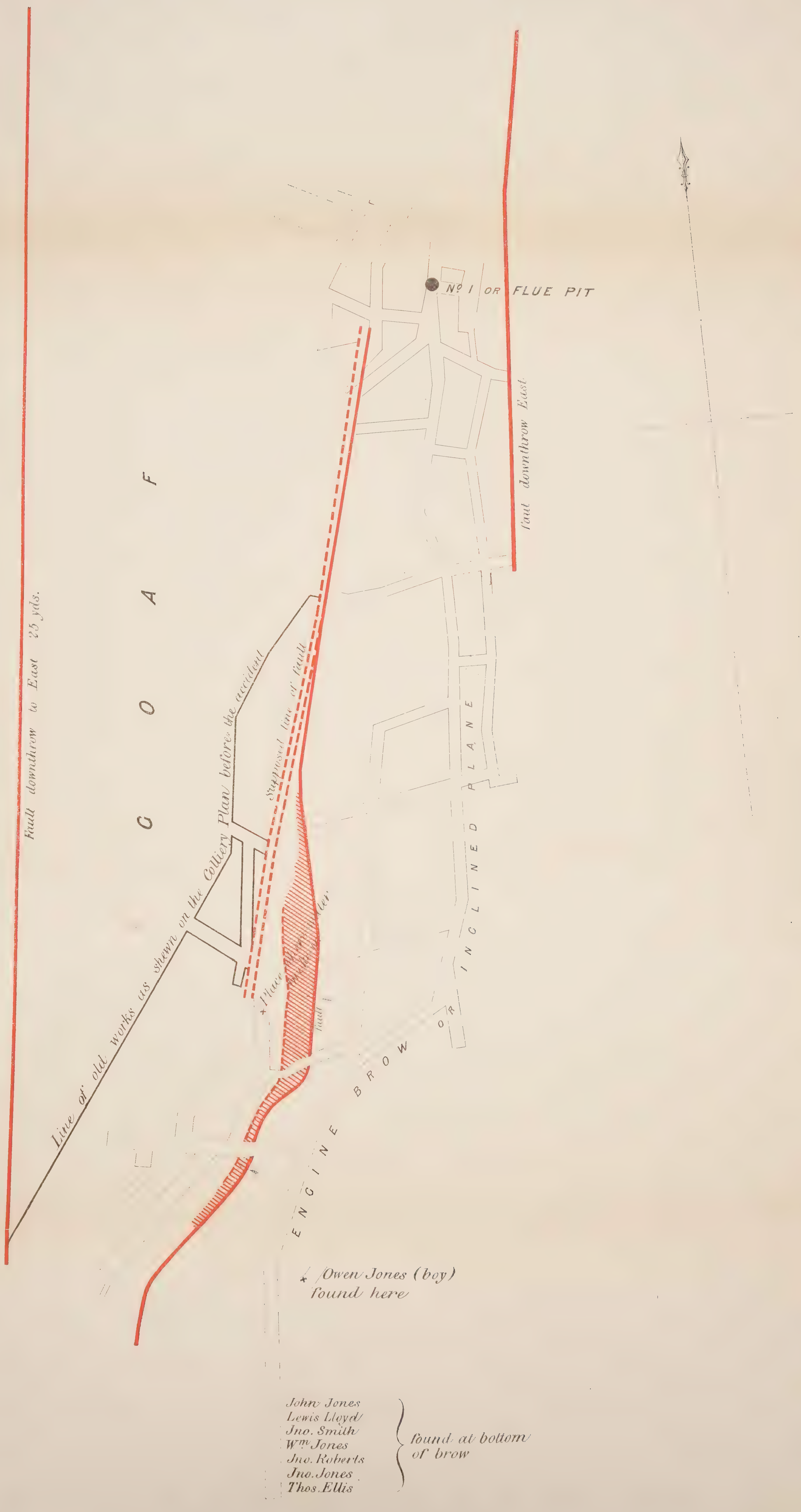
N. 1.

PLAN

intended to represent the workings at

LEESWOOD MAIN COLLIERY

Prior to the accident on the
15th Decr. 1861.



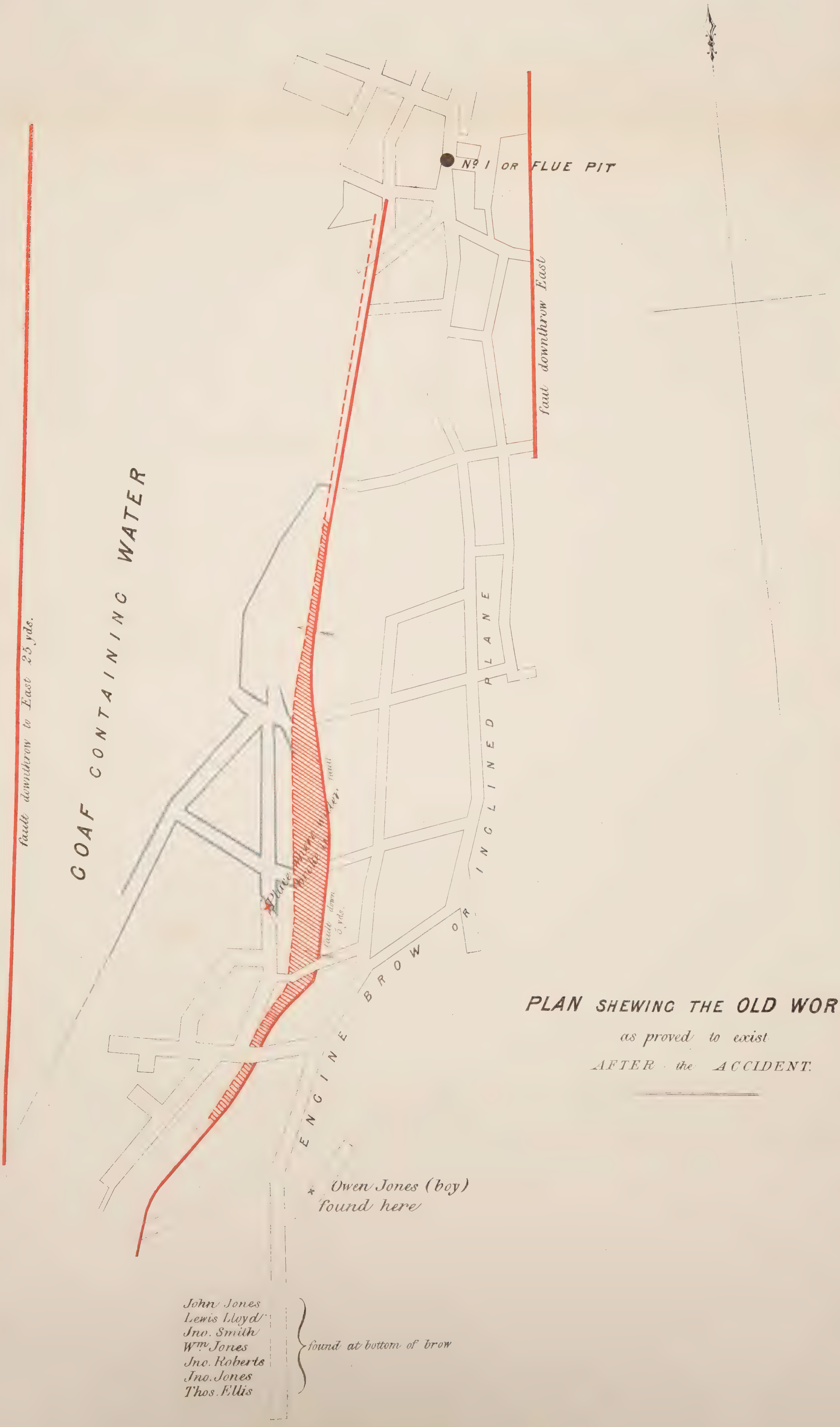
Nº 1 OR FLUE PIT
Fault downthrow East
Fault downthrow to East 25 yds.
G O A F
Line of old works as shewn on the Colliery Plan before the accident
Supposed line of fault
× Place
fault
INCLINED PLANE
OR
ENGINE BROW
× Owen Jones (boy) found here
John Jones
Lewis Lloyd
Jno. Smith
Wm. Jones
Jno. Roberts
Jno. Jones
Thos. Ellis
found at bottom of brow

SCALE 22 YDS. TO AN INCH.

No. 2.

LEESWOOD MAIN COLLIERY.

South Side Workings.


No. 1 OR FLUE PIT
fault downthrow East
fault downthrow to East 25 yds.
COAF CONTAINING WATER
INCLINED PLANE
ENGINE BROW OR
Place where water broke in
fault down 5 yds.
fault
× Owen Jones (boy) found here
John Jones
Lewis Lloyd
Jno. Smith
Wm. Jones
Jno. Roberts
Jno. Jones
Thos. Ellis
found at bottom of brow

PLAN SHEWING THE OLD WORKS
as proved to exist
AFTER the ACCIDENT.

SCALE 22 YDS. TO AN INCH.

Mr. Evans' Report.

REPORT on the INSPECTION of COAL MINES, and the MINES of IRONSTONE of the COAL MEASURES worked in connection with COAL, in the DISTRICT comprising the COUNTIES of DERBY, NOTTINGHAM, LEICESTER, and WARWICKSHIRE, for the Year ended 31st December 1864.—By THOMAS EVANS, Esq., F.G.S.

SIR, Belper, February 28, 1865.

I have the honour to submit herewith my annual report on the working of the several Acts of Parliament for the Regulation and Inspection of Mines.

The number of fatal accidents and loss of life is, I regret to say, in excess of the preceding year, and indeed of the average of the last nine years.

On reference to the reports of the late Inspector I find the average of deaths for the nine years is 51, whereas this year it is 66.

The quantity of coal worked in the nine years is 53,536,000 tons; lives lost 463; or one death to about 113,463 tons of coal. This year the coal worked is about 7,300,000 tons; lives lost 66, or one death to 110,606 tons of coal worked.

The total quantity of coal raised in England, Wales, and Scotland last year was about 96,000,000 tons; lives lost 867, or one death to about 110,726 tons. It will be seen that although there is a considerable addition to the list of deaths in the Midland district, yet in comparison with the coal raised the result is not so unsatisfactory.

Deaths.	Explosions.	Inundations of water.	Falls of Coal and Roof.	In Shafts.	Crushed by Trams and Tubs.	Total.	Tons of Coal raised.	Tons raised for each Death.
In 1856	3	–	21	16	6	46	4,500,000	97,000
1857	15	–	14	6	20	55	4,750,000	86,000
1858	–	–	16	16	10	42	5,060,000	121,000
1859	2	–	18	13	7	40	5,460,000	134,000
1860	3	–	21	13	13	50	6,215,000	124,000
1861	3	23	21	15	7	69	6,503,319	94,000
1862	2	–	25	4	12	43	6,647,000	154,000
1863	4	5	26	9	8	52	7,000,000	134,000
1864	11	–	30	9	16	66	7,300,000	110,606

Explosions of gas.

Eight explosions of gas have taken place during the year, and they were attended with the loss of ten lives; one poor man died this year from injuries received at the High Park Colliery in November 1863, and is included in the total return.

Falls of roo

The increase in the number of lives lost from "*Falls of the roof and sides of workings*" is to some extent due to the rapid development of the coal mines of Derby and Nottinghamshire; the employment of inexperienced hands consequent on the great demand for labour. In the nine years ended 31st of December 1864, one life was lost to 289,142 tons of coal, by *falls of roof, &c.*, whereas in the same period by *explosions of gas* one life was lost to 1,245,007. Under these circumstances the attention of the managers of mines should be directed to this the greatest source of danger. Great and frequent supervision is absolutely necessary, as well as the use of timber whenever and wherever it is required.

I am constantly pointing out on my inspection visits places insufficiently timbered, and often find within reach a plentiful supply ready for use.

Men will not give themselves the little trouble necessary to make all safe even when their own lives depend on it.

Crushed by trams or tubs.

Seven lives were lost by being "crushed against the sides" or "run over" by tubs or trams. Four of the sufferers were under 14 years of age, two under eighteen years, and the other above 30 years of age. The introduction of machinery has perhaps added to the danger of accident on the travelling roads. The places of refuge have been found, especially on incline planes, most useful, and in many cases independent roads are made for travelling on, parallel with the inclines.

Shafts.

Shaft accidents are nine this year; this is considerably below the average of the nine years. It is, however, my duty to report that some of these nine were, with ordinary care preventible; for instance, crossing under the shaft whilst the carriage was in motion, there can be no necessity for incurring danger from this practice, as it is so easy to pass through the carriage (or chair), or better still by the travelling road, which is now provided at all well laid out collieries. Lumps of coal falling from the top killed two men at the same collieries; surely with care this can easily be prevented; and one life was sacrificed through the breaking of a rotten rope, and is again particularly referred to in this report.

Very many of the winding shafts of the district are still left without the self-acting fence, now so generally used; and in one case, an ironstone mine belonging to the Staveley Iron and Coal Company, if the fence had been in working order, probably one life would have been saved.

The machinery and fittings of the new shafts are for the most part well made and efficient, and very much less liable therefore to accident.

Miscellaneous.

Under the head Miscellaneous it will be seen that four lives were lost by explosions of blasting powder, one of these was a premature explosion, the others to men returning in consequence of the "shot not going off" in the time usually allowed.

In all cases the *fuse* should be sufficient to allow ample time for retreat to a place of security, and in case of supposed failure the place should be left a considerable time before going to it, so as to be certain that the chance of explosion is at an end.

Surface.

The accidents on surface were two, in the one case a man was run over by a railway waggon, and the other was injured by the colliery trams running over him.

Bratticed shafts.

I am glad to be able to report there is no colliery in this district, the ventilation of which is wholly dependent on a bratticed shaft; I believe that every mine has now two or more shafts.

The Act of Parliament 25 and 26 Vict., cap 79, which came into operation on the first day of this year (1865) is complied with, to the extent of having two or more outlets; possibly there are some without available machinery to secure ready means of ingress and egress.

I do not anticipate any difficulty in carrying out the spirit and meaning of the Act of Parliament.

Non-fatal accidents.

There have been many explosions of gas and accidents of various kinds this year, though fortunately unattended with loss of life, nevertheless in some cases the injuries have been very serious.

The explosions have occurred through the neglect of the officers of the colliery not removing gas directly it is discovered; the very dangerous practice that prevails in this district of "brushing out" or "baffling" the gas (as it is called) instead of removing it by means of ventilation; and sometimes through the men themselves going into places other than where they work.

Prosecutions.

With your permission, proceedings have been taken against the following persons for violations of the Act of Parliament:

The owner and agents, Springfield Colliery.
The chief agent of West Staveley Colliery.
The chief agent of Butterley Coal Company, and his under-agents at Mexbro' Colliery.

Penalties, fines, or costs were imposed.

Employment of boys.

At all the collieries I have visited, the general rule with regard to the employment of boys is not to allow them to work in the mine under the age of 12 years, and by this means the owners relieve themselves of the responsibility of attending to certificates. I do not think it will be found convenient to allow boys to absent themselves from the mines for the purposes of attending schools, and in my opinion the age of twelve years is quite young enough to commence an occupation attended with so much danger. There are now provided at or near most collieries schools at which parents can secure for their children a sufficient education to enable them to occupy the several positions in the mines.

Ironstone mines.

Only one death has been reported to me this year, and that was a man who fell from the surface down the shaft.

A report of an explosion of gas was also received, one man slightly burned.

It would be much more satisfactory if all ironstone mines of the coal measures were included in the Act of Parliament; it is somewhat difficult to define what really is an ironstone mine within the meaning of the Act. The return of accidents is, therefore, very unsatisfactory.

No. 11 *accident.—Church Greasely explosion.*

This explosion occurred in a roadway which had been partially closed at one end. The deceased was in the habit of putting his *tools* in this level as a matter of convenience. On the day of the accident it appeared some gas had accumulated in the roof, there being little or no air passing at the time. The unfortunate man's light fired the gas and his life was lost from the effects of the explosion.

This was not a working place, neither was it a road to a "working place."

No. 16 *accident.—Clay Cross explosion.*

Two men were killed by this explosion. Gas came off suddenly near the face and directly on to the naked lights. I had not left the South Wales district when this and the last explosion occurred, but I understand that generally these collieries are provided with a sufficient ventilation.

No. 20 *accident.—Explosion at Monkwood Colliery.*

I examined this colliery and found the ventilation was inadequate, that in places the air was not conducted sufficiently near to the "*face*" of coal, and altogether the underground management was bad. It is a new colliery (working the black shale coal), and ought in my opinion to be worked exclusively with locked lamps until such time as the works are properly opened out.

The owner, Mr. Plevins, has agreed to adopt my suggestion, and use lamps; at the Coroner's inquest he undertook to pay to the widow of the deceased the sum of 20*l.*, and, I believe, most, if not all of it has been paid to the clergyman of the parish.

No. 25 *accident.—Explosion at Springfield Colliery.*

This is a small colliery in the outlying district a few miles from Sheffield, working the lower coals. The airways I found to be in a wretched condition, very long and much contracted, the quantity of air was very small, not sufficient for the safety of the mine under ordinary circumstances. The owner and manager of the colliery was convicted for not having an adequate amount of ventilation in obedience with the first general rule.

No. 34 *accident.—Kilburn Colliery.*

William Wheatley, a collier, lost his life on the 7th September at Mr. Ray's colliery, Kilburne. It appeared some men were at work making a communication to connect two exploring drifts, in one of them, they had improperly allowed gas to accumulate, and in removing it, sufficient care was not taken to exclude naked lights. The general ventilation of this colliery was defective; preparations were however making, and will soon be carried out to better its condition.

No. 46 *accident.—Cinder Hill Colliery.*

This is a very extensive colliery in the county of Nottingham, the property of Mr. Thomas North. The explosion of gas which caused the death of William Marlow took place on the 26th of October. I examined the colliery, and also attended the inquest on the body (held by Mr. Brown, borough coroner) at the Nottingham Infirmary.

The point at which the explosion took place was at the extreme end of the workings, down what is called the Bulwell drift, a distance from the shaft nearly two miles.

When I examined the workings, gas was coming off from the coal in considerable quantities, and at several places it was at an explosive point. On the day of the explosion a collier worked in the innermost stall, and with him two boys. From the evidence it would appear that the man was supplied and worked with a safety lamp, but the boys in the same stall, and within a few yards of the man, used naked lights, the consequence was (soon after the man left his place) gas accumulated until at last the place was in an explosive state, and an explosion did take place at one of the boy's lights.

For some days before the explosion, gas was known to be in the workings in some quantities; the air was conducted through a very small area at the back of the brattice, and not sufficiently near to the face; independent of this there was not air enough going into the district of the mine. The return airways, generally, were small.

The jury returned the following verdict:—"That William Marlow died from the "effects of burning caused by an explosion of gas at Cinder Hill Colliery, and that the "accumulation of gas was the result of insufficient ventilation."

I commenced proceedings against the owner of this mine, but on the distinct promise that he would appoint a mining engineer of experience, and give him the entire control and management of the colliery, I consented to withdraw the charges.

I am glad to be able to report the owner has acceded to my request, and now the responsibility of laying out and carrying on these extensive collieries rests with Mr. Woodhouse of Derby, who will, I feel sure, do all that is necessary for the safety of those employed.

I pointed out at this inquest the impropriety and danger of continuing to work with a safety-lamp in an explosive mixture. The feeling among some, that when gas is discovered, and men are furnished with safety-lamps, all is done that is necessary; that it is safe to continue to work with a lamp, which in fact means nothing more nor less than substituting these instruments in lieu of ventilation, a practice most dangerous to life and property. Directly gas is seen, men ought at once to discontinue working; this is done in all well-regulated collieries; and I was very much surprised to hear an opinion expressed that this was not the custom in some parts of Nottinghamshire.

No. 54 *accident.—High Park Colliery explosion.*

This is another large colliery in the county of Nottingham, the property of Messrs. Barber, Walker, and Company.

The night deputy found in one of the gate roads leading to the working places some gas near to the roof; he removed it by means of a brattice; but in a very short time after taking away this brattice gas again made its appearace. The night fireman (deputy) then suspended a safety-lamp some distance down the gateroad, as he said to warn people of the danger; he then told the men not to go in with their naked lights, but to extinguish them before getting to the place, pass in under the gas in the dark, and relight their candles in their working places; this they did. The day deputy when he came at 7 o'clock in the morning, hearing of this gas, went to the place, and on getting there took off his coat and "brushed" (swept) the gas on to the naked lights and instantly an explosion took place.

At my request the manager instituted proceedings against the under-viewer and the two deputies.

1st. The under-viewer ought to have had more air passing up the gate-road.

2d. The night fireman ought to have removed the gas, or stopped the men going in until he had informed the viewer.

3d. That the day fireman ought not to have "brushed out" gas, the more especially when he must have known the colliers and others were at work. These matters were violations of the special rules, and the magistrates fined each officer.

No. 62 *accident.—Mexbro' Colliery explosion.*

This is one of the mines belonging to the Butterley Iron and Coal Company.

On the morning of the explosion a deputy, in making his examination of the colliery, found in a stall some quantity of gas. He drew deceased's attention to it, and left with him (unlocked) a Biram's lamp to be used if required. He took no means of removing the gas, he allowed the men to work with naked lights near the place, and, as was most probable, an explosion soon after he left took place.

I examined the mine and did not consider the first general rule fully complied with. There was not an adequate amount of ventilation in the stall.

The manager had not appointed a sufficient number of competent men to examine the colliery.

The coroner's jury added to their verdict the following remarks:—"That the pit was "insufficiently managed in not carrying out the safety rules, and there had been great "neglect on the part of the owners, or their agent, in allowing men the use of lamps "without having them first properly examined and locked."

With your permission I instituted proceedings against the manager, Mr. William Bean, and his overman. On Mr. Bean's promising in court that he would meet me at the colliery, and carry out any, and all, reasonable suggestions I might make for the safety of those employed, I consented, on his paying the costs, not to press for a conviction.

The overman was fined in each case. I trust these cases will be a warning to the under-agents of the district, and that violations of the rules are matters of serious importance.

No. 44 *accident.—Rope breaking. Swadlincote Colliery "Limited."*

Deceased was employed at the colliery as a sinker; it was necessary before they recommenced sinking, that the sides of the old shaft should be properly examined and made safe for this purpose; a rope was furnished him by the colliery engineer. It appeared from the evidence given before the deputy coroner this rope had been out of use some considerable time, exposed to the weather, and the condensed water from some steam pipes was continually dropping on it.

I examined the rope and found it perfectly rotten in half a dozen places, and it was shown in evidence that although the engineer knew this rope had been so exposed, yet he did not take the trouble and do his duty as pointed out by the special rules, examine the rope before giving it to deceased. I pointed out to the jury that if this duty had been properly performed the poor man's life would not have been sacrificed.

We were not allowed the benefit of hearing the remarks offered by the deputy coroner in his summing up the evidence to the jury, the room was cleared of all save the jury; and it is difficult to understand how in the face of the evidence a verdict of "accidental death" was arrived at.

The engineer was not allowed to occupy the position after the inquiry.

Number of collieries.

There are in the Midland district of inspection about two hundred separate collieries producing, as before stated, about 7,300,000 tons of coal.

In this district there is no doubt but that the Acts of Parliament for the regulation of mines have worked satisfactorily; much indeed has been done to improve the system of mining, the machinery, and all matters relating to the safety of those employed. The mines are becoming more extensive and of considerably greater depth, the difficulties to contend with are much more serious and will become so each year, as there will be a very much larger quantity of gas to deal with and existing under great pressure. The employment of skilful mining engineers will be a necessity; and as regards inspection it should be borne in mind that it is not intended that Inspectors should act as the viewer or manager of collieries, but to be in their districts that matters can be referred to them. That in case of complaint, or reason to suspect danger or neglect of the Act, mines are now inspected, and mines are also inspected on the occurrence of any accident which appears to require it; and it is necessary this investigation should be made in order that it may be ascertained whether the requirements of the Act have been complied with, and that if necessary penalties for neglect may be proceeded for; such investigations press the responsibility of the management upon the only parties to whom it attaches, and apparently produce good effect. They are also the means of causing precautions to be taken which are likely to prevent accidents. If the view taken by some parties, that inspection should reach further than this, were acted upon, it would tend to relieve the owners and managers of the responsibility which now devolves upon them.

I have, &c.
THOMAS EVANS,
Inspector of Mines.

The Right Hon. Sir George Grey, Bart., G.C.B.,
Her Majesty's Principal Secretary of State,
&c. &c. &c.

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS of LIFE arising therefrom, in the DISTRICT comprising the Counties of DERBYSHIRE, NOTTINGHAMSHIRE, LEICESTERSHIRE, and WARWICKSHIRE, during the Year ended 31st of December 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owners' or Agents' Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.									
									Explosions.	Inundations of Water.	Suffocations.	Falls of Coal.	Falls of Roof.	Crushed by Trams.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.																		
Jan. 7	1	Babbington	Nottingham	Thomas North	Thomas Murdon	Collier	30	Fall of roof	—	—	—	—	1	—	—	—	—	—
„ 16	2	Swanwick	Alfreton	W. P. Morewood	John Dawes	Ditto	22	Explosion of gunpowder	—	—	—	—	—	—	—	1	—	—
„ 25	3	Swadlincote	Burton-on-Trent	Hall and Boardman	Samuel Evans	Driver	15	Run over by loaded train	—	—	—	—	—	1	—	—	—	—
Feb. 4	4	Snibstone	Leicester	Stephenson and Company	Philip Cook	Loader	22	Fall of roof	—	—	—	—	1	—	—	—	—	—
„ 17	5	Beggarlee	Nottingham	Barber, Walker, and Co.	John Davis	Collier	33	Premature explosion of shot	—	—	—	—	—	—	—	1	—	—
„ 24	6	Riddings	Alfreton	Oakes and Co.	James Hunt	Pony driver	16	Fall of roof in November 1863	—	—	—	—	1	—	—	—	—	—
Mar. 7	7	High Park	Nottingham	Barber, Walker, and Co.	Thomas Dennis	Ditto	14	Explosion of gas Nov. 1863	1	—	—	—	—	—	—	—	—	—
„ 15	8	New Hollinwood	Chesterfield	Stavely Iron and Coal Co.	George Sage	Miner	30	Fall of roof	—	—	—	—	1	—	—	—	—	—
„ 18	9	Whitwick	Leicester	John Whetstone	John Felstead	Ditto	20	Ditto	—	—	—	—	1	—	—	—	—	—
„ 28	10	Brunedge	Stockport	L. E. Hall	Jos. Richardson	Collier	—	Ditto	—	—	—	—	1	—	—	—	—	—
Apr. 5	11	Church Greasley	Burton-on-Trent	Marquis of Hastings	Reuben Bosworth	Ditto	—	Explosion of gas	1	—	—	—	—	—	—	—	—	—
„ 6	12	Shipley	Derby	A. M. Mundy	John Osborne	Ditto	21	Fall of roof	—	—	—	—	1	—	—	—	—	—
„ 7	13	Cadley Hill	Burton	Hall and Boardman	Joseph Dennis	—	—	Ditto	—	—	—	—	1	—	—	—	—	—
„ 15	14	Riddings	Alfreton	Oakes and Co.	Joseph Rayner	Collier	28	Fall of roof December 9, 1863	—	—	—	—	1	—	—	—	—	—
„ 23	15	New Hollinwood	Chesterfield	Stavely Iron and Coal Co.	William Hawkins	Ditto	—	Fall of roof	—	—	—	—	1	—	—	—	—	—
May 19	16	Clay Cross	Ditto	Wm. Jackson, M.P., & Co.	Thomas Gaw Michael Hands	Ditto Ditto	22 26	Explosion of gas	2	—	—	—	—	—	—	—	—	—
„ 30	17	Glascote	Tamworth	Firmstone and Co.	Samuel Salt	Boy	13	Fall of roof	—	—	—	—	1	—	—	—	—	—
June 16	18	Clay Cross	Chesterfield	Wm. Jackson, M.P., & Co.	Lynam	Ditto	—	Ditto	—	—	—	—	1	—	—	—	—	—
„ 20	19	Ditto	Ditto	Ditto	Miskell	Collier	42	Ditto	—	—	—	—	1	—	—	—	—	—
„ 24	20	Monkwood	Ditto	C. H. Plevins	Edward Becket	Ditto	40	Explosion of gas	1	—	—	—	—	—	—	—	—	—
„ 24	21	Swannington	Ashby-de-la-Zouch	William Worswick	Thomas Macauley	Boy	13	Explosion of gunpowder	—	—	—	—	—	—	—	1	—	—
July 7	22	High Park	Nottingham	Barber, Walker, and Co.	George France	Collier	—	Fall of roof (coal)	—	—	—	1	—	—	—	—	—	—
„ 18	23	Langley	Ditto	Butterley Iron Company	Alfred Gillet	Ditto	17	Fall of roof (coal)	—	—	—	1	—	—	—	—	—	—
„ 18	24	Staveley	Chesterfield	Stavely Iron and Coal Co.	William Simons	Ditto	25	Fall of roof (coal)	—	—	—	1	—	—	—	—	—	—
„ 25	25	Springfield	Dronfield	Addy and Ward	William Rawson	Ditto	40	Explosion of gas	1	—	—	—	—	—	—	—	—	—
Aug. 3	26	Hollinwood	Chesterfield	Stavely Iron and Coal Co.	Jonathan Wagstaff	—	13	Crushed by tubs	—	—	—	—	—	1	—	—	—	—
„ 13	27	Shipley	Derby	A. M. Mundy	Henry Jones	Collier	28	Run over on surface	—	—	—	—	—	—	—	—	1	—
„ 20	28	Ripley	Ditto	Butterly Iron Company.	Samuel Rondall	Haulier	14	Kicked by a horse	—	—	—	—	—	—	—	1	—	—
„ 28	29	Hartshay	Ditto	Ditto	James Barton	Collier	58	Fall of roof	—	—	—	—	1	—	—	—	—	—
„ 28	30	Smoile	Ashby-de-la-Zouch	William Worswick	Thomas Poole	Labourer	32	Ditto	—	—	—	—	1	—	—	—	—	—
„ 28	31	Gilt Brook	Nottingham	Nicholson and Hicks	Enoch Smart	Collier	53	Fall of roof (coal)	—	—	—	1	—	—	—	—	—	—
Sept. 5	32	Swadlincote	Burton	Hall and Boardman	William Smith	Flueman	74	Fell off carriage in shaft	—	—	—	—	—	—	1	—	—	—

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.									
									Explosions.	Inundations of Water.	Suffocations.	Falls of Coal.	Falls of Roof.	Crushed by Trams.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.																		
Sept. 5	33	Wilnecote	Tamworth	Perris and Harris	William Page	Collier	—	Fall of roof	—	—	—	—	1	—	—	—	—	—
„ 7	34	Kilburn	Derby	John Ray	William Wheatley	Ditto	—	Explosion of gas	1	—	—	—	—	—	—	—	—	—
„ 9	35	Granville	Burton	Trustees of C. Granville	John Harrison	Ditto	34	Run over	—	—	—	—	—	1	—	—	—	—
„ 16	36	Whitwick	Leicester	John Whetstone	James Gamble	Ditto	30	Fall of stone	—	—	—	—	1	—	—	—	—	—
„ 23	37	Clay Cross	Chesterfield	William Jackson, M.P., and Co.	Job Booth	Ditto	67	Fall of roof	—	—	—	—	1	—	—	—	—	—
„ 27	38	New Beechwood	Alfreton	Charles Seeley	John Armstrong	Boy	13	Run over on incline.	—	—	—	—	—	1	—	—	—	—
„ 28	39	Hollinwood	Chesterfield	Stavely Iron Company	James Harvey	Collier	24	Fall of stone	—	—	—	—	1	—	—	—	—	—
„ 29	40	Clay Cross	Ditto	William Jackson, M.P., and Co.	Joseph Kay	Ditto	45	Fall of cage in shaft	—	—	—	—	—	—	1	—	—	—
Oct. 3	41	Speedwell	Ditto	Stavely Iron and Coal Company.	Thomas Hall	Ditto	14	Crushed by cage passing under shaft.	—	—	—	—	—	—	1	—	—	—
„ 7	42	Eckington	Ditto	J. and G. Wells	John Divett	Ditto	—	Fell into sump	—	—	—	—	—	—	1	—	—	—
„ 23	43	Swannington	Ashby-de-la-Zouch	William Worswick	John Newbold	Loader	—	Fall of roof	—	—	—	—	1	—	—	—	—	—
„ 27	44	Swadlincote	Burton-on-Trent	Limited Liability Company	William Wildsworth.	Sinker	54	Rope broke. This rope was unfit for use.	—	—	—	—	—	—	1	—	—	—
„ 30	45	Speedwell	Chesterfield	Stavely Company (Limited)	Jeddiah Godwin	Boy	13	Fell into "staple" and was drowned.	—	—	—	—	—	—	1	—	—	—
„ „	46	Cinder Hill	Nottingham	Thomas North	William Marlow	Ditto	13	Explosion of gas	1	—	—	—	—	—	—	—	—	—
Nov. 7	47	Glascote	Tamworth	Firmstone and Co.	Amos Faulkes	Hitcher	28	Lump of coal fell down shaft	—	—	—	—	—	—	1	—	—	—
„ 10	48	Bennerley	Ilkeston	George Parker	William Hopkinson	Loader	15	Fall of roof	—	—	—	—	1	—	—	—	—	—
„ 11	49	Seymour	Chesterfield	Stavely Iron and Coal Company.	Joel Cashmere	Collier	30	Shot went off unexpectedley	—	—	—	—	—	—	—	1	—	—
„ „	50	Oakthorpe	Ashby-de-la-Zouch	Marquis of Hastings	Samuel Bradshaw	Horse driver.	13	Run over by trams	—	—	—	—	—	—	—	—	1	—
„ 22	51	Swanwick	Alfreton	W. P. Morewood	Abraham Paskins	Boy	13	Fall of roof	—	—	—	—	1	—	—	—	—	—
„ 23	52	Swanwick	Ditto	Ditto	Peter Elliot	Collier	31	Ditto	—	—	—	—	1	—	—	—	—	—
„ 17	53	Snibstone	Leicester	G. R. Stephenson and Co.	John Craven	Ditto	23	Ditto	—	—	—	—	1	—	—	—	—	—
„ 18	54	High Park	Nottingham	Barber, Walker, and Co.	Thomas Davis & Abraham Brown	Ditto Ditto	15 18	Explosion of gas	2	—	—	—	—	—	—	—	—	—
„ 19	55	Clay Cross	Chesterfield	William Jackson, M.P., & Co.	Samuel Adkins	Ditto	55	Fall of roof	—	—	—	—	1	—	—	—	—	—
Dec. 5	56	High Park	Nottingham	Barber, Walker, and Co.	William Mellor	Hitcher	42	Carriage in shaft was let down. Mistake in signals.	—	—	—	—	—	—	1	—	—	—
„ 13	57	Hawksbury	Bedworth	J. Darlington and Co.	Thomas Betts	Labourer	18	Run over engine bank	—	—	—	—	—	1	—	—	—	—
„ 9	58	Hawksbury	Ditto	Ditto	Thomas Brooks	Boy	13	Run over self-acting incline	—	—	—	—	—	1	—	—	—	—
„ 14	59	Whitwick	Leicester	John Whetstone	Thomas Blockley	Horse boy	13	Run over	—	—	—	—	—	1	—	—	—	—

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.									
									Explosions.	Inundations of Water.	Suffocations.	Falls of Coal.	Falls of Roof.	Crushed by Trams.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864. Dec. 19	60	Swadlincote -	Burton-on-Trent	Hall and Boardman -	William Walley	Collier -	26	Suffocated in trying to put a fire.	–	–	1	–	–	–	–	–	–	–
,, 29	61	Glascote -	Tamworth -	Firmstone and Co. -	William Johnson	Hanger-on	35	Lump of coal fell down shaft	–	–	–	–	–	–	1	–	–	–
,, 30	62	Mexbro - -	Mansfield -	Butterly Iron Company -	John Fulwood -	Collier -	45	Explosion of gas; inadequate ventilation.	1	–	–	–	–	–	–	–	–	–
,, ,,	63	Swadlincote -	Burton-on-Trent	Limited Company -	William Bonor -	Collier -	22	Fall of roof (coal) - -	–	–	–	1	–	–	–	–	–	–
,, 31	64	Wingerworth -	Chesterfield -	Carrington and Co. -	- - -	Hitcher -	—	Slipped on plates; injured his head.	–	–	–	–	–	–	–	1	–	–
								Total - -	11	–	1	5	25	7	9	6	2	66

Summary of Deaths, 1864.

	Explosions.	Inundations of Water.	Suffocations.	Falls of Coal.	Falls of Roof.	Crushed by Trams.	In Shafts.	Miscellaneous.	Above ground.	Total.
January - - - - - - - -	–	–	–	–	1	1	–	1	–	3
February - - - - - - -	1	–	–	–	2	–	–	1	–	4
March - - - - - - - -	–	–	–	–	3	–	–	–	–	3
April - - - - - - - -	1	–	–	–	4	–	–	–	–	5
May - - - - - - - -	2	–	–	–	1	–	–	–	–	3
June - - - - - - - -	1	–	–	–	2	–	–	1	–	4
July - - - - - - - -	1	–	–	–	3	–	–	–	–	4
August - - - - - - -	–	–	–	1	2	1	–	1	1	6
September - - - - - - -	1	–	–	–	4	2	2	–	–	9
October - - - - - - -	1	–	–	–	1	–	4	–	–	6
November - - - - - - -	2	–	–	–	5	–	1	1	1	10
December - - - - - - -	1	–	1	1	–	3	2	1	–	9
Total - - - -	11	–	1	2	28	7	9	6	2	66

Mr. Wynne's Report.

REPORT on the INSPECTION of MINES for the DISTRICT comprising NORTH STAFFORDSHIRE, CHESHIRE, and SHROPSHIRE, for the Year ending 31st December 1864.

SIR, Stone, February 28, 1865.

THE time having now arrived for me to report to you the number of fatal accidents that have occurred in my district during the year 1864, I beg to lay before you a tabulated list of the accidents, and also to point out to you the causes that led to most of them. The number of accidents amount to 45, causing the deaths of 54 persons, and I regret to say that this is an increase of two in the number of separate fatal accidents, and eight in the number of deaths caused by such accidents, as compared with the Return for the year 1863, and this is almost entirely owing to

Explosions of Fire-damp.

From time to time I have stated that under this head there ought to be but few names in my list, and every succeeding inquiry into the causes of explosions confirms my often repeated opinion that, if every colliery had a good and efficient manager, who energetically performed his duty, explosions of fire-damp would be few and far between. This statement may appear startling to the general body of coal proprietors, but as its correctness is quite evident after continual investigations into the causes of accidents, it is but right that they should have the question clearly laid before them, for with them only rests the responsibility, and the power, of appointing intelligent managers to their mines, and thus prevent those dire calamities that cause so much regret after they have happened, but which, in a great measure, they have the power to prevent. The first general rule lays down clearly enough that, " An adequate amount of ventilation shall be " constantly produced in all coal mines or collieries, and ironstone mines, to dilute and " render harmless noxious gases to such an extent that the working places of the pits, " levels, and workings of every such colliery or mine, and the travelling roads to and " from such working places, shall, under ordinary circumstances, be in a fit state for " working and passing therein." If this rule were strictly carried out how could explosions be, to say the least, probable. The second general rule makes it compulsory that, " All entrances to any place not in actual course of working or extension, and suspected " to contain dangerous gas of any kind, shall be properly fenced off so as to prevent " access thereto," therefore, the first provides that there shall be no dangerous gas in the working places, the second that all other places shall be fenced off, whilst the third provides for lamps only being used where required. Then comes the question, why do explosions occur? This admits of a very plain answer. If the sole control of a mine is placed in the hands of a man who is but one remove from a working miner, and not the most intelligent of that class, how can we expect that those delicate tests, by which the presence of fire-damp is ascertained, will be regularly applied, or be relied on to use those appliances, by the adoption of which, accumulations of gas are almost impossible. Some managers of this class have admitted the fact of having assisted on many occasions to brush out the gas from places where the men were going to work the same morning, and some have been appointed on account of that very equivocal qualification of having been burned themselves.

No. 9 in the list was fatal to five lives, and was one of those cases where the commonest foresight would have prevented the accident. When this pit was sunk an explosion occurred on reaching the coal, causing the death of one of the proprietors and another man, so that all parties were aware of there being a large amount of gas in this particular coal, yet as soon as they had driven the level to the boundary, seven stalls were commenced and worked up several yards without a thirling or " cut through," or even brattice to ventilate five out of seven of these stalls, and this with the coal rising 18 inches in a yard. The manager and underlooker were together " latching," or surveying this part of the workings the day before the explosion, and left with the full knowledge of the existence of gas, and that it was brushed out every morning. On this state of things being brought before the magistrates the full penalty of 20*l*. was imposed on the owners, and paid over to the widows of the deceased.

No. 18 caused one death. The deceased and another man were sent to cleanse out some dirt that had fallen in an old waggon road now used as an airway, but nearly choked up; the gas was known to have accumulated, yet one man went to work with a lamp, the other with a naked light. When I designated this state of things "disgraceful" the proprietor made an attempt to justify the conduct of his underlooker.

No. 23. In this case two men were sent down in the night to remove some gas which had accumulated in the rise workings, and in doing so the gas had to be brought down into the level and then pass up to a furnace pit some distance to the rise. The manager's theory is that the two men, after forcing out the foul air, were returning along the level with their lamp tops off, and walking into the gas fired it; but it is quite as probable that the first part of the gas caused a slight explosion at the furnace which brought the larger quantity and caused the heavy explosion; this is another of those cases where accumulations of gas are allowed to pass over the furnace, causing much loss of life and an enormous loss of property, as in this case.

No. 25 is a case where a pair of stone drifts were driven out of a main horse road with a door to turn the air through the drifts, but during a suspension of them this door was left open or partially open; the deceased, a boy about fifteen, was sent into the drift for a shovel, and fired the gas. Here again a prosecution was ordered, and a conviction obtained against the chartermaster, under whose care the door was placed.

No. 30 caused three deaths. The coal had been worked up to a leap or fault of several feet, and a heading was commenced at each end of the drift to the upper side of the fault, and then across to meet each other, and as there was a fair amount of air passing through the drift moderate attention to the bratticing would have prevented this sad accident. Here again the fire-damp was known to be present, but as the men in the heading worked with lamps no danger was apprehended, forgetting that the gas from the heading had to pass over the naked lights in the drift.

No. 31 was caused by every man being his own master, and working their stalls with or without brattice as they thought fit; and the inclination of the coal being considerable a place become foul, and on the deceased holing into it an explosion was the consequence.

No. 33 was not so fatal in its results as it may have been, for according to the evidence, and judging from the state in which I found the mine on inspection, it is most fortunate that two of the proprietors, the underlooker, and many of the men were not killed or seriously burnt. Here also the gas was known to exist in large quantities, and the men were allowed to work within a few feet of it with naked lights.

No. 35. In this case locked lamps ought to have been introduced before the explosion as a preventative, as this mine is at all times dangerous, unless every precaution be taken. Although the deceased person was in charge of that part of the workings and was cautioned by the men under him he felt so confident the place was clear that he entered it with a naked light.

No. 37 is one of the most painful incidents to speak of. This lad of sixteen was, with a young man, cleansing out the main airway with naked lights, when the return air being foul it ignited, and although the poor boy was within six yards of a door into the drift little or no effort was made to rescue him. It is not often we hear of colliers being afraid to enter the mine after an explosion to save their fellow men, but in this instance all presence of mind seems, for a time, to have left them.

No. 39. In consequence of this accident two men lost their lives, entirely from the want of ventilation and the best use being made of what air there was at command; but here, like so many other places, the most primitive modes of working were thought sufficient to meet any emergency that might arise, bratticing being hardly known by name.

Such are the leading features of most of the explosions during the last year, and very discreditable they are to the management in my district; and you may rely on my reporting every case where there appears the slightest negligence with a view to a prosecution as the surest means of bringing both masters and managers to a due sense of their responsibilities.

Falls of roof and coal.

Much has been done and much more remains to be done to bring down the deaths by this cause to something like what must reasonably be expected where the dangers are so imminent. This being the most prolific source of accidents, it has been my constant endeavour to bring all who are engaged in mining to a lively sense of the importance of propping the roof, whether it be considered safe or not, for what builder would think of taking out the front of a house, without shoring up the roof and floors; in like manner, no coal should be taken from under the roof without at once placing some timber as a temporary support where the natural support has been taken away. To some extent my efforts have been a success, for during last year the accidents were 13 and the lives lost 13, which will bear a comparison with any other district in the kingdom. Still there is much to be done by pointing out to the underlookers that it is their duty to see the timber properly set, and that punishment will certainly follow any neglect of this important precaution. It was generally considered by chartermasters that if they ordered the men to set timber where the roof was dangerous their liability ended; but the magistrates have lately decided that the special rule makes it incumbent on them *to see it set*. There is no fall of roof calling for any particular remarks as nearly all were preventable by proper application of timber, but we must not expect that every danger can be foreseen.

In Shafts.

The number of accidents and of lives lost is the same as in the previous year; but this is not satisfactory to me, for so long as the present system of open shafts, without guides, continues to prevail, so long will men fall from the surface, from part way down, be struck by things falling from the surface, and by things falling from part way down. In this, as in all other things, improvements are prevented by the ignorance of the parties in charge of mines, who set their faces against all improvements, and in some cases push their ignorance so prominently forward as to say "They would not go down the pits if their masters introduced guides." There have been but two deaths by breakage of ropes, one of which was caused by a reckless disregard of danger rarely to be met with. The deceased, with another man, undertook to sink a shaft for an innkeeper, for a given sum, providing as best they could the materials to do it with. After sinking 10 or 12 yards, and finding the rope too short, the deceased borrowed an old rope from a builder who had bought it a year or two before at a clearance sale; they had scarcely commenced sinking when it broke and caused the death of the unfortunate man.

That there should be no case of over-winding to record is very creditable to the care and attention of the men in charge of the engines, whose energies are sorely taxed by the many hours they are on duty.

Miscellaneous causes

Have produced five accidents and five deaths, which is a decided improvement on former years, especially when we consider the vast increase there is in inclined planes, now so generally adopted, and the great danger attending them. I have taken every opportunity to caution boys against going before the tubs to start them, and against trying to catch them at the bottom which are the causes of nearly all the accidents on inclines in my district.

The two deaths by trams and tubs were the result of putting men to do dangerous work, who were strangers to the pit and totally unfit for such occupations. The death caused by suffocation was a sad affair; a collier, who was in impaired health, was on the night turn and was put to work in a place where the air was fouled by the quantity of fire-damp given off from the face; finding himself somewhat exhausted he went on to a heap of slack to lie down and was suffocated without a struggle. Such was the state of the mine on inspection that I felt bound to take proceedings against the manager, and a fine of 10*l.* was inflicted.

Above ground.

Three lives have been lost above ground, one by that dangerous practice of screwing up machinery whilst in motion, the other two from circumstances not to be controlled. It is however with renewed satisfaction that for the eighth time I can say the year has passed over without a boiler explosion.

It is not usual with me to point out any particular colliery where more than an average amount of fatalities have occurred, but I cannot pass over the fact of five accidents out of 45 happening at the Botteslow and Brookhouse Collieries, and that the loss of life arising therefrom was nine out of 54. Such facts as these need no comment.

Ironstone Mines.

There is a very serious increase in both accidents and deaths, owing in some measure to the prolonged strike in some districts, for it is invariably the case that as soon as the men resume work, more than the usual number of fatalities occur by reason of the roadways and workings being out of repair and deranged, the owners and chartermasters being anxious to send out as much mine as possible and the men being desirous to earn all they can in order to rub off the debts contracted during the strike. The shaft accidents in number are not creditable to the parties concerned; but what I have said as to coal mining applies also to ironstone, namely, that improvement is not possible without an entire change of system. No. 7 in the list was one of those cases so simple in themselves that you wonder how it could possibly happen. The hooker-on allowed two men and six boys to prepare for ascending, and after hooking the safety hook into the ring of the main chain, got in himself and gave the signal to be drawn up, but when they were about half-way to the top the nine persons fell to the bottom of the shaft. On examination after the accident all appeared in thorough repair, so that there can be no doubt that the point of the hook was placed *on* the ring instead of *through* it, so that the broad point of the hook, owing to the safety joint being near the point, caused this very melancholy accident.

Education.

Having made personal inquiries at nearly all the large collieries as to the working of the educational clauses of the Mines Inspection Act, I find that in nearly every case the employers dismissed all boys under 12 years of age rather than be troubled with the the certificates of attendance at school, and with the irregular hours of attendance at work which the schooling produced. There are some cases where a few boys are employed under 12 years of age, and as far as my knowledge of the facts extend the proper certificates are filed; but as a rule no boys under 12 are employed.

In a large portion of my district the butty or chartermaster system prevails and places the proprietors in a serious dilemma, they being liable for any breaches of the law, although they neither engage nor pay the boys, hence the broad principle is laid down by the proprietors that no boy under 12 shall be employed in the pits.

It is not any deficiency in the number of schools nor the want of support by the masters that causes the mining population to be so far behind some other portions of the working classes, but it is the want of that domestic sympathy which is so rarely shown by the employer towards the employed. When a colliery is opened the men obtain cottages as near to their work as possible, whilst the master generally resides some distance away from the colliery, thus severing that tender link between the wife and daughters of the master and the wives and families of the workmen, which generally produces such habits of cleanliness and good order where regular visits are made to the cottages and schoolroom of a colliery village.

All my inquiries tend to confirm my former opinion that no great inconvenience would have been felt had boys been prohibited from working in the pits under 12 years of age.

Inspection.

Some misconception seems very generally to prevail as to the duties of inspectors, it not being thought sufficient that they should see that the requirements of the Act are strictly carried out, and that the causes of accidents should be thoroughly inquired into with the certainty of any culpable negligence being punished; but it would never do to relieve the owners and managers of mines of the responsibility which now devolves upon them and throw it upon the Government, for this they could not possibly undertake unless there were as many inspectors as managers, having an equally numerous staff, with power of control over the expenditure.

Whenever complaints are made, or there is reason to suspect danger, or that the requirements of the Act are neglected, pits are inspected and the required steps taken to prevent accidents occurring. Pits are also inspected on the occurrence of any accident which appears to require it, still it never was contemplated that the inspectors should act as the viewers or managers of the collieries, but being in the district all matters relating to danger can be referred to them for their assistance and advice.

I have, &c.
THOMAS WYNNE,
Inspector of Mines.

The Right Hon. Sir George Grey, Bart., G.C.B.,
Her Majesty's Principal Secretary of State.

LIST of the FATAL COLLIERY ACCIDENTS and LOSS OF LIFE arising therefrom, in the NORTH STAFFORD, SHROPSHIRE, and CHESHIRE DISTRICTS, during the year ending 31st December 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. Jan. 4	1	Bradley Green	Congleton	W. Bradbury	Thomas Bayley	Banksman	42	Fell from the landing stage on to railway	–	–	–	–	1
„ 5	2	Hamill	Burslem	N. P. Wood	J. W. Ogden	Collier	26	Suffocated by carburetted hydrogen	–	–	–	1	–
„ „	3	Madeley Wood	Wellington	Anstice and Co.	T. Durnall	Banksman	50	Walked into the pit in the night	–	–	1	–	–
„ 11	4	Blue Hills	Leek	Blue Hills Company	R. Moss	Collier	27	Fell from a mouthing into the sump	–	–	1	–	–
„ 15	5	Pinnox	Tunstall	H. H. Williamson	J. Lightfoot	Banksman	42	Fell down the shaft	–	–	1	–	–
„ 29	6	Bredbury	Stockport	Thomas Livesey	T. Perry	Hooker-on	14	Fell into the sump	–	–	1	–	–
Feb. 13	7	Bank Top	Tunstall	Stott and Co.	W. Harrison	Horse-keeper	—	Crushed between the cage and inset	–	–	1	–	–
„ 25	8	Brookhouse	Hanley	Pratt and Co.	J. Hughes	Collier	—	Fall of roof	–	1	–	–	–
Mar. 2	9	Ditto	Ditto	Ditto	D. Grattan and 4 others.		—	Explosion of fire-damp	5	–	–	–	–
„ 4	10	Lawton	Tunstall	Bidder and Co.	J. Phillips	Waggoner	—	Tub upset and crushed him	–	–	–	1	–
„ 7	11	Dunkirk	Dukinfield	Dunkirk Company	W. Kemp	Miner	—	Fall of coal	–	1	–	–	–
„ 10	12	Pinnox	Tunstall	H. H. Williamson	G. Selman	Waggoner	16	Crushed by tub on incline	–	–	–	1	–
„ 11	13	Poynton	Stockport	Lord Vernon	Thomas Eccles	Furnaceman	79	Rope broke whilst descending	–	–	1	–	–
„ 13	14	Silverdale	Newcastle	Silverdale Company	R. Lockett	Collier	—	Fall of roof	–	1	–	–	–
„ 15	15	Botteslow	Hanley	Pratt and Co.	R. Edwards	Engineman	49	Crushed whilst fastening a nut. (Engine in motion.)	–	–	–	–	1
„ 18	16	Priors Lee	Wellington	Lilleshall Company	G. Pinner	Hooker-on	29	A brick fell out of the shaft	–	–	1	–	–
„ 23	17	Hadley	Ditto	Ditto	Thomas Pierce	Loader	35	Fall of roof	–	1	–	–	–
Apr. 5	18	Fenton Park	Stoke	Fenton Park Company	R. Eckersley	Ditto	25	Explosion of fire-damp	1	–	–	–	–
„ 25	19	Bredbury	Stockport	Thomas Livesey	J. Clayton	Collier	—	Ditto	1	–	–	–	–
„ 27	20	Berry Hill	Stoke	W. Bowers	E. Jocelin	Sinker	—	Scaffold in shaft gave way	–	–	1	–	–
May 2	21	St. Georges	Wellington	J. Poulteney	G. Astbury	Ditto	50	Rope breaking	–	–	1	–	–
„ 20	22	Bentilee	Longton	Hawley and Co.	Job Finney	Driver	13	A waggon of dirt fell on him	–	–	–	1	–
„ 27	23	Silverdale	Newcastle	Silverdale Company	G. Dunn and another		—	Explosion of fire-damp	2	–	–	–	–
June 2	24	Bucknall	Hanley	Gerrard and Hawkes	G. Evans	Collier	47	Fall of coal	–	1	–	–	–
„ 14	25	Lilleshall	Wellington	Lilleshall Company	A. Webb	Driver	17	Explosion of fire-damp	1	–	–	–	–
„ 29	26	Madeley Wood	Ditto	Anstice and Co.	T. Hill	Ditto	15	Fall of roof	–	1	–	–	–
July 4	27	Brookhouse	Hanley	Pratt and Co.	W. Eaton	Banksman	—	A piece of the drum fell on him	–	–	–	–	1
„ 6	28	Bucknall	Ditto	Gerrard and Hawkes	William Jones	Collier	—	Fall of roof	–	1	–	–	–
„ 18	29	Berry Hill	Stoke	W. Bowers	Job Plant	Driver	—	Explosion of fire-damp	1	–	–	–	–
Aug. 9	30	Poole Dole	Fenton	William Hulse	Thomas Howell and two others.		—	Ditto	3	–	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age	Cause of Death, and Remarks.	No. of Lives lost. Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. Aug. 9	31	Bucknall -	Hanley -	Simpson and Co. -	J. Kirkham -	Collier -	—	Explosion of fire-damp - - -	1	–	–	–	–
„ 17	32	Muxton Bridge	Wellington -	Lilleshall Company -	W. Phillips -	Driver -	11	Fall of roof - - - - - -	–	1	–	–	–
„ 19	33	Stamfields -	Burslem -	Cork, Ford, and Co. -	John Vare and another.	Ditto -	—	Explosion of fire-damp - -	2	–	–	–	–
„ 25	34	Cobridge -	Ditto -	Pearson and Co. -	William Love -	Banksman -	—	Fell down the shaft - - - -	–	–	1	–	–
Sept. 2	35	Bucknall -	Hanley -	Gerrard and Hawkes -	J. Beswick -	Doggy -	—	Explosion of fire-damp - - -	1	–	–	–	–
„ „	36	Botteslow -	Ditto -	Pratt and Co. -	G. Johnson -	Loader -	26	Fall of coal - - - - -	–	1	–	–	–
Oct. 5	37	Foley -	Longton -	W. H. Sparrow -	J. Bartlett -	Ditto -	17	Explosion of fire-damp - - -	1	–	–	–	–
„ 10	38	Dawley -	Wellington -	Coalbrookdale Company -	J. Guest -	Ditto -	45	Fall of roof - - - - -	–	1	–	–	–
„ 22	39	Ravenslane -	Newcastle -	Leighton and Co. -	J. Bailey and another.	Ditto -	—	Explosion of fire-damp - - -	2	–	–	–	–
Nov. 2	40	Ivy House -	Hanley -	Ivy House Company -	J. Banks -	Collier -	58	Fall of roof - - - - -	–	1	–	–	–
„ 7	41	Lawley -	Wellington -	Coalbrookdale Company -	W. Deakin -	Boy -	—	Fall of coal - - - - -	–	1	–	–	–
„ 29	42	Drill -	Oswestry -	Croxon and Co. -	G. Lloyd -	Banksman -	—	Fell down the shaft - - - -	–	–	1	–	–
Dec. 4	43	Talk-o'-th'Hill -	Newcastle -	N. S. Coal Company -	W. Hargreaves -	Collier -	28	Explosion of fire-damp - - -	1	–	–	–	–
„ 12	44	Lilleshall -	Wellington -	Lilleshall Company -	J. Williams -	Ditto -	—	Premature explosion of a shot - -	–	–	–	1	–
„ 21	45	Bunkers Hill -	Newcastle -	W. Rigby -	T. Colclough -	Ditto -	28	Fall of roof - - - - -	–	1	–	–	–
								Total - - - -	22	13	11	5	3

SUMMARY.

Cause of Death.	Jan.	Feb.	March.	April.	May	June.	July.	August.	Sept.	October.	Nov.	Dec.	Total.	Increase.	Decrease.
Explosions -	–	–	5	2	2	1	1	6	1	3	–	1	22	11	–
Fall of Roof -	–	1	3	–	–	2	1	1	1	1	2	1	13	–	2
In Shafts -	4	1	2	1	1	–	–	1	–	–	1	–	11	–	–
Miscellaneous -	1	–	2	–	1	–	–	–	–	–	–	1	5	–	3
Above ground -	1	–	1	–	–	–	1	–	–	–	–	–	3	2	–
	6	2	13	3	4	3	3	8	2	4	3	3	54	8	–
No. of accidents -	6	2	9	3	3	3	3	5	2	3	3	3	45	2	–

Deaths in North Staffordshire, 39; Increase, 9.
„ Shropshire, - - 11; „ 1.
„ Cheshire, - - 4; decrease, 2.
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NUMBER and NATURE of FATAL ACCIDENTS to PERSONS employed in and about COAL MINES and COLLIERIES in the District comprising NORTH STAFFORD, SHROPSHIRE, and CHESHIRE, during the Years 1860, 1861, 1862, 1863, and 1864.

Year.			Falls in Mine.			In Shafts.									Miscellaneous Underground.									On Surface.				
		Explosions of Fire-damp.	Falls of Coal.	Falls of Stone.	Total Falls in Mines.	Overwinding.	Ropes and Chains Breaking.	Whilst ascending or descending.	Falling into Shaft from Surface.	Things falling from Surface.	Falling from part way down.	Things falling from part way down.	Miscellaneous in Shafts.	Total in Shafts.	Explosions of Gunpowder.	Suffocation by Gases.	Irruptions of Water.	Falling into Water.	On Inclined Planes.	By Trams and Tubs.	By Machinery Underground.	Sundries Underground.	Total { Miscellaneous Underground.	By Machinery on Surface.	Boilers Bursting.	Miscellaneous on Surface.	Total on Surface.	Gross Totals.
1860	Number of Accidents - - -	12	6	15	21	–	3	2	4	–	4	1	2	16	–	2	–	–	1	1	1	1	6	2	–	–	2	57
,,	Number of Deaths - - - -	13	6	16	22	–	6	6	4	–	4	1	2	23	–	3	–	–	1	1	1	1	7	2	–	–	2	67
1861	Number of Accidents - - -	3	5	9	14	–	–	3	6	2	3	2	3	19	1	–	–	–	1	2	–	–	4	1	–	–	1	41
,,	Number of Deaths - - - -	3	5	9	14	–	–	4	6	2	3	2	3	20	1	–	–	–	1	2	–	–	4	1	–	–	1	42
1862	Number of Accidents - - -	4	9	16	25	–	1	1	2	1	2	–	1	8	–	–	1	–	5	2	2	1	11	1	–	–	1	49
,,	Number of Deaths - - - -	6	9	16	25	–	12	1	2	1	2	–	1	19	–	–	3	–	5	2	2	1	13	1	–	–	1	64
1863	Number of Accidents - - -	9	4	10	14	1	1	1	3	–	2	3	–	11	–	–	–	1	3	2	–	2	8	–	–	1	1	43
,,	Number of Deaths - - - -	11	4	11	15	1	1	1	3	–	2	3	–	11	–	–	–	1	3	2	–	2	8	–	–	1	1	46
1864	Number of Accidents - - -	13	4	9	13	–	2	1	4	–	3	1	–	11	1	1	–	–	1	2	–	–	5	2	–	1	3	45
,,	Number of Deaths - - - -	22	4	9	13	–	2	1	4	–	3	1	–	11	1	1	–	–	1	2	–	–	5	2	–	1	3	54

LIST of the FATAL IRONSTONE ACCIDENTS and LOSS of LIFE arising therefrom in the NORTH STAFFORD, SHROPSHIRE, and CHESHIRE DISTRICTS, during the year ending 31st December 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	No. of Lives lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864.													
Jan. 21	1	Shelton - -	Shelton - -	Earl Granville - -	H. Morgan -	Miner -	36	Premature explosion of a shot -	–	–	–	1	–
Mar. 3	2	Chell - -	Tunstall - -	R. Beswick - -	— Hankey -	Ditto -	47	Breaking of a wire rope - -	–	–	1	–	–
„ 4	3	Ditto - -	Ditto - -	Ditto - -	J. Clarke - -	Ditto -	28	Fall of roof - - -	–	1	–	–	–
June 20	4	Madeley Wood	Wellington - -	Jno. Anstice and Co. -	T. Skitt - -	Ditto -	43	Ditto - - - -	–	1	–	–	–
Sept. 15	5	Bent - -	Tunstall - -	R. Heath - -	J. Procter - -	Banksman -	26	Pushed the tub into shaft, and fell with it.	–	–	1	–	–
„ 20	6	Clough Hall -	Ditto - -	T. Kinnersley's Executors	W. Hancock -	Driver -	13	Fall of roof - - -	–	1	–	–	–
„ 27	7	Madeley Wood	Ironbridge - -	Jno. Anstice and Co. -	Three men and six boys.	- - -	—	The skip became detached whilst coming up the shaft.	–	–	9	–	–
Oct. 5	8	Madeley Court	Ditto - -	W. O. Foster - -	G. Wellings -	A boy -	14	Fall of roof - - -	–	1	–	–	–
„ 7	9	Lilleshall -	Wellington - -	Lilleshall Company -	J. Jackson - -	A girl -	—	Fell down the shaft whilst banking for her father.	–	–	1	–	–
„ 24	10	Silverdale -	Newcastle - -	Silverdale Company -	S. Yoxall - -	Sinker -	60	Crushed against the side whilst ascending.	–	–	1	–	–
„ 28	11	Chatterley -	Tunstall - -	Williamson, Brothers -	J. Hudson - -	A boy -	13	Got entangled in a break chain -	–	–	–	1	–
Nov. 4	12	Silverdale -	Newcastle - -	Silverdale Company -	W. Lawton -	Miner -	50	Fall of roof - - -	–	1	–	–	–
„ „	13	Ditto - -	Ditto - -	Ditto - -	E. Barnett - -	Sinker -	23	Explosion of a shot that hung fire -	–	–	–	1	–
„ 28	14	Goldenhill -	Tunstall - -	Williamson, Brothers -	W. Whittaker -	Banksman -	41	Fell down the shaft - -	–	–	1	–	–
Dec. 1	15	Lightmoor -	Wellington - -	Coalbrookdale Company -	J. France - -	Miner -	—	Fall of roof - - -	–	1	–	–	–
„ 6	16	Shelton - -	Shelton - -	Earl Granville - -	W. Stanley - -	Butty -	41	The rope broke whilst ascending -	–	–	1	–	–
								Total - -	–	6	15	3	–

SUMMARY.

Cause of Death.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	Total.	Increase.	Decrease.
Explosions - -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2
Falls of Roof -	–	–	1	–	–	1	–	–	1	1	1	1	6	2	–
In Shafts - -	–	–	1	–	–	–	–	–	10	2	1	1	15	12	–
Miscellaneous -	1	–	–	–	–	–	–	–	–	1	1	–	3	3	–
Above ground -	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	1	–	2	–	–	1	–	–	11	4	3	2	24	15	–
No. of accidents -	1	–	2	–	–	1	–	–	3	4	3	2	16	8	–

Deaths in North Staffordshire, 11 ; increase, 9.
„ Shropshire - 13 ; „ 6.
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Mr. Brough's Report.

Report of the Working of the Mines Inspection Act (23 & 24 Vict. c. 151.) for the South-western District, during the Year ended 31st December 1864.—By Lionel Brough, Esq., F.G.S.

Sir, Clifton, 11th March 1865.

The "Lists" of the South-western Division of Great Britain for the year 1864 I now have the honour to lay before you. They comprise details of all the occurrences in the mines of the district; and, for the most part, every item contained in the five customary columns is so minutely particularized, as, with but few exceptions, to render further individual notice of them in the body of the Annual Report altogether supererogatory.

The accidents in coal amounted to 60, and the mortality consequent thereon to 67, a result which, when set against the previous year, is most unquestionably in its favour. This is still further borne out by the new "Form" the Inspectors have from this time henceforth to return; for, in the one which I have prepared for 1864, it will be seen that a life was lost for every 89,231·34 tons of coal produced, whilst in 1863 the proportion had actually risen to 105,416 tons.

In that same year "fire-damp" killed only three persons; unfortunately in 1864 six lives were sacrificed, certainly a sad falling off. But considering the fiery nature of the collieries of the district, there is still reason to be thankful that the loss was confined even to that number, great as by comparison it may appear.

"Fall of coal and stone" mounted high, as it always does, but decidedly favourable when put by the side of 1863, which recorded 38 deaths, whilst the year now under report passed over with only 33.

Death in "pit shafts" reached 12 in 1863; this year it is one more, both numbers far too high for the credit of the district.

The mortality from "Miscellaneous causes under ground" in the year, is altogether without comparison or approach to its predecessor, 12 lives having been lost against three only in 1863. This is the worst result of all the five fatal columns of the list throughout the present year.

Death by "Surface accident" is just one less, three only having occurred in 1864, whilst four happened in 1863. Considering the advantage the surface possesses in better light and a greater abundance of it; and also in the total absence of the more dreadful of the predisposing causes which exist in subterranean workings, I am of opinion that our accident lists ought to be free from any fatal record whatever above ground; they never ought to take place.

The "non-fatal" occurrences I also beg permission to lay before you, and they too appear to be augmented in number when compared with those of 1863. It is but right, however, to observe, that since the passing of the Act of Parliament requiring this class of notification, the managers of my district have, year by year, added to their information in this respect. They now make known to me every description of casualty they hear of in their mines, whether of a serious character or otherwise; and this is by far the safest and fairest mode of procedure, because it has already been found that an injury which at the time of its occurrence appeared of no serious import, or rather indeed was thought to be of a most trivial kind, resulted nevertheless, on more than one occasion in death, and consequent coroner's inquisition; it is thus evident that it is better both for managers and inspectors that every case of injury should be duly reported.

Ironstone being under inspection I have the honour to remit the "Lists" for the past year.

The South-western district of the kingdom contains very many iron mines, and yields an immense amount of native material; possibly it may claim to be the most considerable producing division of the whole twelve. This, as a matter of course, adds largely to the labour of the Inspector, and runs up his detail of death to a grave and serious amount. Nevertheless, though the quantity of mineral excavated and landed exceeded that of the previous year, the number of persons killed was happily less, the returns being nineteen lives lost in 1863, and but seventeen in the year following. Thus, it is gratifying to be able to record that one of the departments of the district, at all events, manifested both advance and improvement in 1864.

These native clay bands must be more and more sought for in accordance with the increasing requirement by engineers of the quality of toughness and durability in railway bars and other classes of finished iron. I made some mention of this fact in the last year's report and reproduce the statement here to show that the district must, as time goes on, increase in the development of this its valuable source of mineral wealth and prosperity.

Although the following casualties do not come within the limits of the Inspection Act, the record of death in my district will not be altogether complete without some notice of their occurrence, and some remark or description as to how each accident took place.

On the 11th of January a boy was killed in the Dowlais Company's Edgehill Works in the Forest of Dean, but, as the iron mine in which he lost his life is in immediate connection with the carboniferous limestone, it is not an accident that can come under the notice of the Inspector, or find a place in his records.

J. Bliss, a labourer in the Frampton Cottrell iron mines in the county of Gloucester, was drowned on the 5th of February in a ditch near the works, but not in connection with them. He was subject to epilepsy, and no doubt under its influence fell into the water.

Thomas Wilcox was run over by a railway truck near the Machen Colliery on the 25th of January, but as it is a railway accident it is not inserted in the usual lists.

George Norton lost his life on the road near Messrs. Cossham and Wethered's Parkfield Colliery on the 12th of February. This too was a railway fatality.

John Hayes died on the 10th of November in consequence of injuries received on the 23d of September on the railroad near Messrs. Cossham and Wethered's Kingswood Colliery.

David Hobley, forge labourer, fell down one of the cinder pits at Blaenavon on the 24th of October and was killed. But as he was not a collier or miner and had no business there, the death can find no possible place in any of the lists. The only thing remarkable about it is how he could fall past the timber uprights.

Michael Sweeney was killed at Ebbw Vale on the 12th of November by a locomotive engine running up against a loaded coal truck.

William Warfield lost his life on the 8th of December, near the Nailsea pit, by being crushed between two trucks. This, like some of the others now mentioned, is a matter for railway inspectors rather than for those who have charge of mines.

The various "lists" and these eight cases will, on perusal, exhibit the following returns:

Fatal accidents in coal 60, causing 67 deaths; non-fatal accidents in coal 97, causing injury to 109 persons; fatal accidents in ironstone 17, causing 17 deaths; non-fatal accidents in ironstone 13, causing injury to 13 people; accidents above described as not being under inspection,—but notwithstanding that investigated—eight, causing eight deaths. The whole amounts to a grand total of 197 accidents, 92 persons killed, and 122 wounded. This account of death, contusions, fractures, amputations, and other surgical operations, altogether sounds like the description of military movements in the field rather than the ordinary report of industrious and peaceful pursuits; nevertheless, year by year the same melancholy record has to be made out and submitted to public notice.

Having thus briefly enumerated all the casualties of the district, I will now specially notice a few of those to which more than the usual serious interest is attached, as already intimated in the first page of this report.

No. 32 in the list records a lamentable event, no less than the death of four persons by explosion of fire-damp at Pontypool in the Glyn pits, of which the Ebbw Vale Company are the proprietors. In this case the haulier undoubtedly left open the doors that turned the air up the No. 10 cross heading through certain mouthed wooden trunks. It was thus cut off for an hour, and sufficient time was afforded for the gas to accumulate in dangerous quantity in the far end. The men, in returning to their work after having partaken of their meal, went thoughtlessly and heedlessly in towards the face with candles, and explosion immediately ensued. Henry Vaux was suffocated on the spot by the after damp, and the others were so badly burned and injured that they all three succumbed not many days afterwards. The pit does not reach my standard of ventilation by any manner of means whatever, but in the instance under notice there is every reason not only to be grieved, but to be surprised at the occurrence, because two of the poor sufferers were men advanced in life and possessed of considerable experience. When they found the doors open they ought certainly to have reflected on the danger of entering without safety lamps. When doors that ought to be shut are found wide open in a colliery known to throw off carburetted hydrogen gas, it almost amounts to insanity to go into such a place with naked flame. However, the officers who had charge of that particular part of the pit are more to blame than the men who lost their lives, for not looking sharper after them and seeing that everything was in its normal state and free from danger. It is another instance of the great desirability of overmen and deputies getting an insight into physics and rudimentary chemistry, and a further proof of what mining schools could effect if they were disseminated throughout the land. A short course of study in such an establishment would have made manifest the risk they ran in entering that cross heading, and also the necessary course to pursue in order to restore it to a condition of safety. In these schools overmen and others would obtain instruction as to the composition and peculiarities of gaseous fluids generally, and as arithmetic and the art of computation is inculcated in all its branches, they would learn how to ascertain the rate of travel of the air in those trunks, and how to square the dimensions of them, and find out by a watch the number of cubic feet per minute that would flow through such restricted passages. A knowledge of these simple calculations would directly lead them to the conclusion that small wooden trunks and sheet-iron pipes are inadequate to clear a fiery end within a reasonable period of time, and ought to be condemned and abandoned. Horse road or gate road areas alone should be trusted for the intake air, because in levels and cross headings these can always be bratticed by boards or canvas until they are far enough forward for the next thirling.

In Mr. Atkinson's book it is stated that "when air is impelled through a confined
" passage, the pressure per unit of surface, or head of air column, required for its pro-
" pulsion, has been found by Péclet, Daubuisson, Girard, and others, to be proportional
" to the square of the velocity, or (what is the same, when the nature and other
" dimensions of the airway remain unaltered,) to the square of the quantity of air
" passing in a given time, divided by the square of the area of the airway.

"The pressure or head of air column required to propel air through a confined
" passage is found to be proportional to the length of the passage, all other things being
" equal.

"The pressure, or head of air column, required to propel air through a confined
" passage is found to be proportional to the perimeter of the section of the passage, all
" the conditions being the same."

The above three paragraphs indicate to the student some idea, not only of the augmentation of power or force needful for increased velocity or volume, but also of the principal frictional conditions that affect the progress of air when travelling through lengthened or restricted passages under ground.

Now in a mining school pupils would acquire familiarity with this class of calculation, as previously observed, and then they would again find proof that twelve inch trunks of great length cannot supply sufficient air to clear the face of a fiery cross heading like the one in the Glyn pit at Pontypool, even when all the doors are closely shut.

I feel constrained again to remark, that when those doors were thrown back as far as they would possibly go, it must have been evident to all that danger was lurking within; in fact, an inflammable magazine, not surpassed even by gunpowder itself.

In Monmouthshire and Glamorganshire the pit shafts are generally of ample, some indeed of remarkable dimensions; but in Gloucestershire and Somersetshire the very contrary prevails, especially in the latter county, where the habit in times past has been to sink them of strikingly narrow diameter. They are, for the most part, however, of very considerable depth, from 560 to 200 yards; anything less than 300 yards is rarely spoken of as being deep at all.

But the striking feature of dimension in Somersetshire is, as above stated, in the width, many of them being only four and a half and five feet in diameter. It will be obvious then to all who are acquainted with those causes of friction that in so peculiar a manner obstruct the passage of air, that such size (not much greater than that of water mains) can never be attended with free ventilation, there is absolutely no room for the passage of air. I have occasionally been told, when exploring these collieries, that they do not require much wind because of the absence of fire-damp. That, however, is not strictly correct, for there are half a dozen of them exceedingly fiery indeed. But to return to those that are not so :—If they do not exude carburetted hydrogen gas, there are some of them sadly infested with black damp, and they should remember that only quick air, and plenty of it, can render such workings safe and wholesome. Here again, if the bailiffs (overmen) had the advantage of mining school tuition the important knowledge of the specific gravity of gases would be imparted to them, and they would learn that carbonic acid (black damp) far surpasses our common air in that respect; and, furthermore, that the disproportion between it and fire-damp in weight is most marked and singular. They would then arrive at the fact that the more ponderous gas is the most difficult of all to remove; the very condition of its greater specific gravity renders it necessary that it should be submitted to the sharpest possible current of fresh air.

The physical properties and chemical composition of all the various gases have been successfully taught for some years past in the mining school at Bristol.

There are no secrets in ventilation. Furnace power in excess, so that less or more wind may be had as required and when wanted; great sectional area wherever air travels under ground, splitting it judiciously; abundant supervision, and complete discipline. These are the simple methods whereby approximate safety may be arrived at and relied on. It matters but little which may be the prevailing danger, fire-damp or black damp, thorough searching ventilation, never neglected, will sweep both, or either, harmlessly and speedily away.

The next remarkable accident to describe is that numbered 41 in the "List." Henry Churchill and Daniel Moses were killed by a heavy fall of roof in the same Glyn pit where the already described explosion of gas took place. They were in the act of stowing some rubbish, but I was told that it was altogether against orders to do so in that particular place, inasmuch as that it was a working stall which they had no right to obstruct, or even to enter. However, be that as it may, they did not effect their object in a dexterous manner. When they had got the load to the mouth they sent the horse into the stall and tackled the chains to the tram, then just outside, after which they made the horse exercise his strength and upset the tram, the rubbish with which it was loaded falling inside of the stall mouth, just in fact what they wished to do as far as that went, but the concussion knocked out one of a pair of timbers which was so entangled and inter-locked with many other props, collars, and laggings, that they all came down together, and the roof of course followed, killing then and there the unfortunate workmen. If they had gone into the stall with the horse, and then forced him on, they would have been safe enough, because a strong lift of coal was up for a roof; but the shale top in the roadway in which the men remained was altogether disintegrated and bad, being long in existence as a travelling road, and much used. When the first prop was dislodged, as a matter of course all the superincumbent mass fell with most crushing effect. The poor sufferers had undertaken to do that which was against standing orders, and unfortunately for themselves, did even that in a slovenly and unskilful manner.

The reigning cause of the destruction of human life is, unquestionably, to be found in the constantly recurring falls of coal and stone from overhead, and from the sides of working places and travelling ways. Fire-damp, though in itself most fearful, cannot for a moment be put in competition with the immense amount of fatality consequent on falls of material under ground. Explosion is, so to say, comparatively rare in its dread occurrence, whereas, taking England, Wales, and Scotland throughout, not a single day may be said to pass without some calamity or other from the never ceasing fall of ponderous masses of coal or shale, of rock or ironstone. In a moment life is crushed out, or bones are smashed and broken in such a manner as to prevent the miner from all future pursuit of his calling.

I continually suggest and advise the more abundant use of timber, and an increased amount of supervision, that is to say, a number of deputies sufficient to leave the stalls or other working places but a very short time per diem without close and rigid examination. If diminution does not take place in this class of fatality, it will sooner or later become a question as to the desirability of more stringent intervention than at present exists in regard of this very serious annual loss of so many of our most valuable operatives.

No. 57 notifies the death of two men in the Kingswood Colliery in Gloucestershire; the brief description given in the "List" requires further elucidation. The Reuben pit in which the accident occurred is about 380 yards in depth, and is not very plumb, and is, moreover, so unequal and rough in its sides for want of lining, that they are obliged to use a peculiarly constructed "man hudge" for travelling in it. Six men were thus descending to their work just after midnight, and they had to get out at a certain platform near the bottom, all the remaining depth below which, is used for sump room or water standage. Now, either the indicator for a moment failed in exactitude (although I found it in good working order on inspection), or, the banksman gave wrong signals; whichever was the case, the "man hudge" went about four feet too low, but the engine was reversed in probably less than half a dozen seconds. However, during this infinitely short period of time two of the men unfortunately struggled out of the hudge, and of course went right into the water. Had they but remained inside they would have been safe enough, and scarcely even wetted. The arrangements for the people to get out of this iron bowk or hudge were very imperfect, the shaft was not a safe one, the distance from the engine to the pit was far too great, there was almost an entire absence of clear signals, and the machinery altogether was certainly not of the kind that I should recommend for winding from a deep and difficult shaft. An idea was started at the inquest, that the engineman might have made a mistake; but as I had most carefully investigated the matter, I came to the conclusion (I believe a correct one), that he, at all events, had complied with his duties in a practical manner.

Shafts, whether sunk through loose strata, very strong shale, or rock itself, should still be solidly lined from surface to bottom; it is the only condition of a pit after all that can be pronounced safe and satisfactory. Steam power in excess in order to carry the strongest of ropes and the largest of rope rolls, strong roomy cages, accurately fitted wooden guides in the pit, and lifting wickets at the top of it, with clear and understandable signals, are arrangements all of the most requisite kind; no pit should ever be geared up in any other manner. It is clear, even to those who are not practical in the matter, that loose skips or hudges working in shafts with jagged unwalled sides must be attended with great and constant danger; in these days of quick winding, such miserable appliances can stand no competition whatever with sound pits and good machinery. Too rigid economy practised in the management of mines defeats itself; accidents, fatal or non-fatal, entail expense on the owners, often in fact, causing far more outlay than would have prevented the calamity.

I am sorry to state that the breaking of a few wire ropes came to my knowledge last year. I again point out, that only the best wire should be used in their fabrication, and that round or flat ropes should never be submitted, either to over weight, or over length of time on the drums. I also beg to notify, that like all other descriptions of band, wire ropes undergo deterioration in upcast shafts, and, therefore, should very frequently be changed for new ones.

Nos. 2, 12, 13, 21, 27, 34, 40, and 52, all refer, more or less, to crush of trams and tubs, accidents much too common in the South-western division of mines, and probably of similar occurrence in some of the other districts, riding on trams, spragging them, or taking out sprags, hauliers putting their backs against the front of the set to check its velocity, all these are sources of danger, and too often end in loss of life or limb. Such casualties last year brought about the death of eight persons.

All main roads should be wide enough and high enough to permit people travelling under ground to pass freely on either side of the trams without being jammed against the sides, or by entanglement thrown under the wheels. The hauliers, carting boys, and others, should be provided with sufficient light to see what they are about, and to put right any derangement that may take place in the harness, horses, tubs, trams, or wheels. Riding in front or behind or between tubs or trams should be discouraged, it is a fruitful source of accident.

The long cross headings in Monmouthshire are at a certain angle, say about half course in the planes of stratification, it follows, therefore, that the gradient is sometimes pretty sharp, and it often occurs that the haulier places himself in front and endeavours by bodily strength to keep the loaded trams from going down hill too fast, as previously recorded, whereby it occasionally happens that he is overpowered and killed or crippled. Then again, trams get off the rails or plates, and when he is striving and struggling to restore them the horse sometimes suddenly goes on and he gets overwhelmed in that manner.

I recommend that the horses should be furnished with shafts or limbers, and then, as they possess greater power of resistance than men and boys, they could keep the loaded set from running wild down hill; here and there this method has been adopted, and met with approval. Rails and plates ought to be firmly laid and fastened, and should be of sufficient weight per yard to bear the continual traffic. Pucking bottoms should be watched and pared down, and the plates relaid; and, of course, the roof constantly looked to, cropped, and re-timbered. More frequent double partings would greatly expedite the transport of the coal and ironstone, and conduce to the general safety of all the people employed—hauliers, colliers, miners, shifters, and wastemen.

There is now much material brought up slopes and planes under ground by engine power, and I regret to have to say that accidents occasionally occur from want of attention to the state of the machinery, boilers, flues, rails, plates, ropes, rollers, and signals. With regard to places of refuge on these lengthened banks, that has been humanely provided for by the Legislature in the eighth general rule; but the state and condition of all the accessories, such as wire ropes and tackle of every description, should be the object of never ceasing care and inspection night and day. Neither money nor skill should be spared to keep everything in good working order, and in that state of safety which the value of human life absolutely demands of the mine owner.

Another source of death by "Miscellaneous causes" is carelessness in the various processes of blasting, as evinced in Nos. 1 and 22. Sinkers, branchers, drifters, and those generally who have to use gunpowder, should be careful about steel tools in tamping, or anything else requiring the pricker or needle,—such implement should invariably be made of copper. Then, again, from imperfect fuse, or other cause at the time unsuspected, a shot does not go off, the workman is anxious to know why, and sometimes has not the patience to wait long enough, and imprudently goes back too soon; perhaps takes a tool in hand to assist in the examination, when in a moment, that very disturbance may quicken the communication with the charge of powder, and in this manner it not unfrequently explodes in his face, killing or maiming him, or depriving him of eyesight for life, by no means an uncommon occurrence. Patience, patent safety fuse, and great carefulness, would often prevent these sad calamities.

I have invariably considered it a duty, never to be omitted in any annual report, to advocate the adoption of the "long wall system" of getting coal and ironstone. In equal manner it concerns the lord of the soil, the proprietor of the mine, and the workman himself. By this method more coal will be raised per acre, it will facilitate ventilation, will be profitable to the owners, and most decidedly attended with increased safety to the operatives, likewise, it will bye-and-bye, when the time shall arrive, admit of much easier application of "machine cutting" than can ever be permitted by pillar and stall. Excavation by the latter mode leaves under ground an irretrievable amount of coal and iron mine; and this proportion with the annual eighty or ninety millions of tons of coal landed, and of clayband ore gotten, of whose quantities no return has hitherto been made, runs up the exhaustion of those minerals to such a prodigious extent as to cause grave anxiety for our successors. The deprivation to posterity by the immense extraction of the present day, added to the loss by buried material, is a serious question, and one that should not be overlooked. Mineral wealth, the greatest a nation can possess, should neither be inconsiderately left under ground, or wastefully used when brought to the surface. A large proportion left in the mine in the shape of pillar, together with unskilful combustion in the daily use of the fuel brought to bank, can only be considered as so much property withdrawn, or withheld from future generations.

In 1864 I had much to do with arbitrations touching second openings under the Act of Parliament 25 and 26 Victoria, cap. 79, and, as in my district an unusul number of collieries are of the single shaft class, and moreover, as most of the owners thereof claimed the privilege of reference in virtue of the fourth section of the Act, it will be seen by my weekly reports that, in addition to the usual routine of duty, I had my time almost continually occupied with those arbitration matters.

Amongst the prosecutions I was instructed to promote under the Act of Parliament 23 and 24 Victoria, cap. 151, one was against the owner of Risca. It took place on the 16th of July last, but after a lengthened hearing the case was dismissed. The only present remark I feel called on to make on the subject is, that I arrive at the conclusion that by such dismissal the magistrates virtually decided that the ventilation of the black vein pit was sufficient for the protection of the lives of the workmen. To such extent, then, it appears that all my responsibility is removed and done away with.

I now obey the commands conveyed in the circular from Whitehall dated the 16th of February of the present year as regards the South-western collieries.

According to the list of last year, framed for the Mining Record Office in Jermyn Street, there are at present 225 collieries in the division under my charge, but the number is liable to fluctuation, because as time goes on corresponding changes take place. Works become exhausted and laid in, new ones are opened out, so that every year alteration is required in the list, and adjustment must be made accordingly, but, on the whole, increase is clearly visible.

In a letter which I addressed to George Clive, Esquire, on the 3d of February 1862, I explained certain circumstances connected with this subject. I had in that communication occasion to speak of the great preponderance of pit shafts as compared with the number of collieries recorded in Mr. Robert Hunt's list of that year; for example, Ebbw Vale is inserted therein as a single coal work, although there are really to be found on that property 19 different openings, for the most part so many separate mines, all extensive, and each under its own particular staff of under-managers, in fact, so many collieries. This statement applies in similar manner to the Bute, Rhymney, Tredegar, Sirhowy, Victoria, Beaufort, Nantyglo, Blaina, Blaenavon, Abersychan, and other immense works, every one recorded in the list as a single colliery; whereas in real fact, each, more or less consists of so many distinct and separate mines, though each, as above stated, compacted into one, in order to exhibit actual ownership and to avoid length and bulkiness in the Mining Record List.

I enumerate the above particular dozen of great establishments as general bases of comparison, but the fact prevails in a lesser degree with very many others of the district, and to such extent exhibits the vast discrepancy between the stated number of collieries and the true number of pits in existence and operation. The information contained in the above quoted letter of the 3rd of February 1862 will, with the date of this present report, find even fuller application. I supply these particulars here because that communication was in consequence of a question that had arisen as to the number of pits, or more properly speaking, of the real extent of mining in the widely spread district of which I have charge.

In a circular bearing date the 26th of November 1864 I am instructed to supply in my annual report information as to the means adopted for the education, in the terms of the statute 23 & 24 Vict., cap. 151, of boys under twelve years of age who may be employed in the coal and ironstone mines of my district.

For some time past the number at that tender age that I have met with in my various inspections have been very few indeed; but that few could certainly manage to read and write, though I must say but indifferently. However, it may be almost said that at the present time there are no such children working under ground, the managers will not take them in under twelve. If boys who have arrived at that age have learned nothing up to that period they certainly do not get much education afterwards, for once set to work in the pit there is little further chance for schooling.

Vast numbers of them are employed as trappers, that is, to attend doors, open them and shut them for the sets of tubs, and above all to see that they are carefully and securely closed after trams or persons have passed either inwards or outwards; ventilation and safety often depends (unfortunately) on the close attention of these young and inconsiderate children.

Their employment does not admit of their availing themselves of any particular hour or hours of the day, or even of certain days of the week to attend school. The pit cannot be suspended for this purpose, for on the regularity of its operation depends much of its despatch and profit. A colliery in its ordinary daily action consists, as it were, of a lengthened chain composed of many workpeople, and the trapper is as much a link in it as the skilful hewer himself; the going away to school of that door boy would sever the continuity of the chain just as much as the withdrawal of any other essential member of the pit's company would.

With regard to night schools, I fear they see but little of the class of lads now under notice; they are too tired with their long hours to go to school when they come up the pit.

Whether or not these boys go to Sunday schools I am unable to give testimony. I rather fear that such attendance is but of rare occurrence. Sometimes I certainly do meet with boys of twelve years of age and upwards who can read, and read very well, but I expect they acquired that knowledge before they commenced underground labour, and consequently before they had attained their twelfth year. So, that after all, the employers' refusal to receive them into the pit under that age does appear to be productive of good as far as education is concerned. But I should like to see that good more expanded and more widely disseminated, although I am unable to suggest any particular method whereby so desirable a result may readily be brought about.

In my report for 1862 I stated that "there was an evident growing desire by the " workpeople themselves for educational improvement; but, notwithstanding that, I " found a considerable proportion of the mining population still deplorably ignorant." The report for the following year was much to the same effect, namely, " that far too " large a per-centage of the people were ashamed of their ignorance, but nevertheless " utterly unable to read and write." Even now, for the last past year, I cannot add much that is promising on the subject, unless, indeed, it be, that where there is a growing desire there is always a hope of something being effected.

There does not appear to be any great lack of schools in my district; go where I will I find them of some class or denomination, and always with a low rate of charge for teaching, varying from one penny to threepence per head per week.

I meet with British, National, and Dissenters' schools in sufficient number, as far as I can judge, to educate the young boys that apply for admission, but I cannot pay attention enough to the subject to enable me to give a sound opinion. I do not often go to these establishments, believing that to be the province of the Inspectors appointed for the purpose; indeed, in all other respects I have neither leisure nor opportunity for making such visits. However, I never fail under ground to inquire about age, education, and certificates. I also do my best to test the acquirements of the boys I meet with in the pit by placing a book or printed paper in their hands, in order to ascertain what progress they have really made.

In all mining districts, and no doubt in others, fathers and mothers are anxious to get their children employed as soon as ever the law will allow them; it greatly assists the house keeping, and parents too often think rather of the boy's wages than of his education. Nevertheless, as often stated in other reports, I do not despair; the tendency of the age is evidently towards increased improvement, and there can be no doubt that that tendency will in the end be sure to work out its own verification.

I have, &c.

Lionel Brough.

The Right Hon. Sir George Grey, Bart., M.P., G.C.B.,
Secretary of State for the Home Department.

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS of LIFE arising therefrom, in the SOUTH-WESTERN DISTRICT OF GREAT BRITAIN, during the Year ended the 31st of December 1864.

The Division of the Coal Mines of Great Britain comprises all Monmouthshire, Gloucestershire, and Somersetshire; also parts of Glamorganshire, Breconshire, and Devonshire.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof and Coal.	In Shafts.	Miscellaneous.	Above ground.
1864. Jan. 13	1	Braysdown -	Somersetshire -	William Savage Wait and Co.	James Webb -	Collier, acting as brancher.	40	Tamping a shot hole he used a steel wire, when suddenly the charge of powder exploded, instantly killing him. If it had been a copper tool he might have been alive at this moment.	–	–	–	1	–
„ 14	2	Camerton new pit.	Somersetshire -	Camerton Coal Company	Eli Young - -	Putter -	16	Running out a tub of rubbish he got before it instead of conducting it from behind, then unfortunately missed his footing, and the fore-wheel broke his leg. He was taken to the Bath Hospital, where, on the 4th of March, amputation took place, but he could not survive it, dying on the following day.	–	–	–	1	–
„ 18	3	Tillery Level -	Monmouthshire -	John Russell - -	William James -	Overman -	50	Whilst oiling the sheave of the surface machine his coat was caught in one of the revolutions and he was drawn in and killed on the spot. There was no occasion for him to meddle with it as his brother was the breaksman, and was actually working the incline at the time.	–	–	–	–	1

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof and Coal.	In Shafts.	Miscellaneous.	Above-ground.
1864. Mar. 19	4	Brithdir Level -	Glamorganshire	P. T. Woodruffe -	Seth Edwards -	Overman -	34	Heavy fall of roof in an old heading then drawing back. The accident was occasioned by his trying to save a prop, which the colliers themselves wished him to leave standing. Thus, to save a shilling's worth of timber a valuable life was lost.	–	1	–	–	–
Feb. 5	5	Huish pit - -	Somersetshire -	Writhlington and Huish Company.	John Vowles -	Collier -	26	Whilst enlarging a main road about a ton of stuff burst off from the side and killed him there and then. The deputy had but just left him when the mass fell, and then a "slip" was perceived, which was not previously visible.	–	1	–	–	–
,, 6	6	Kingswood deep pit.	Gloucestershire	Kingswood Coal Company	William Sage -	Collier -	21	Near the bottom of the main pit (410 yards deep) is a smaller one called a "Tip" (40 yards still deeper) at which deceased was waiting at the bottom seated on the cross bar ready to be drawn up, when a piece of fire-clay fell from near the top and killed him instantaneously.	–	–	1	–	–
,, 11	7	Nantyglo - -	Monmouthshire	J. and C. Bailey - -	Lloyd Hopkins -	Collier -	12	Fall of coal in a stall where he was working with his uncle.	–	1	–	–	–
,, 18	8	Machen - -	Glamorganshire	Machen Coal Company -	John Davis - -	Collier -	16	From an inset 90 yards from the surface, he fell to the bottom of the shaft. There was a door in the inset to keep people off, and four men were actually sitting there, yet the boy went through that door and fell away, no doubt miscalculating the distance.	–	–	1	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. Feb. 18	9	Pennywell Road	Gloucestershire -	G. Chick and Co. - -	Emmanuel Morton	Collier -	64	He was on the top of the water butt, going slowly down to "pick in" and examine the shaft, when the butt or tank came to a length of guide which had started from its perpendicularity by loss of a bolt. This tipped the tank on one side, and he, having a candle in one hand and neglecting to hold on with the other, fell off into the sump and was drowned.	–	–	1	–	–
" 23	10	Forge pit, Blaenavon.	Monmouthshire -	Blaenavon Iron Company	Benjamin Stephens Thomas Stephens	Collier - Ditto -	14 17	These brothers were killed by a heavy fall, which rolled off in consequence of a concealed rough separation in the coal called a "grime," and which, unfortunately, ran in a direction to throw the mass towards them. There certainly ought to have been one prop more set up than I found there.	–	2	–	–	–
" "	11	Nantyglo Yard Seam.	Ditto -	J. and C. Bailey - -	Peter Adams -	Collier -	20	Killed by explosion of fire-damp. He had just taken service, and had stolen in through the slope unknown to the manager, probably to see which was the best working place, when, no doubt, the gas ignited at his candle. He was found lying dead by those who came in.	1	–	–	–	–
" 26	12	Victoria, No. pit.	Ditto -	Ebbw Vale Company -	James Sellick -	Door boy -	13	He was proceeding to his work, and was near the bottom of the engine-bank, when the trams broke loose from the wire-rope and overwhelmed him.	–	–	–	1	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof and Coal.	In Shafts.	Miscellaneous.	Above ground.
1861. Mar. 1	13	Risca black vein	Monmouthshire	T. W. Rhodes	J. Henry Pierce	Haulier	23	Fell under trams and had his leg broken, of which injury he died on the 1st of April.	–	–	–	1	–
„ 25	14	Vobster pit	Somersetshire	S. Steeds and Co.	John Denning	Collier	30	Dropped from the top branch in the shaft to the bottom, and as nobody was with him at the time, it has never been ascertained what caused him to fall.	–	–	1	–	–
„ 29	15	Bedwellty	Tredegar	Tredegar Iron Company	Thomas Davis, Master.	Haulier	28	He was sitting down in the inset, when a sudden noise in the shaft frightened his horse, and the alarmed animal started off knocking Davis down, and the trams went over him. He was severely injured, and died on the 30th.	–	–	–	1	–
April 1	16	Cwmnantddu	Monmouthshire	Ebbw Vale Company	William Porter	Collier	40	Fall of roof, which occasioned such severe injuries as to cause his death the next day.	–	1	–	–	–
„ 5	17	New rock	Somersetshire	New Rock Colliery Company.	William Selway	Collier	30	By superincumbent pressure, a heavy mass of coal flew off the face of work with such violence as to knock him backwards and deprive him of life.	–	1	–	–	–
„ 6	18	Forge pit, Nantyglo.	Monmouthshire	J. & C. Bailey	Edward Nash	Collier	53	Very heavy fall of rock	–	1	–	–	–
„ 7	19	Tredegar No. 8 pit.	Ditto	Tredegar Iron Company	Richard Nenniss	Collier	45	Fall of about four tons of coal in his stall (big vein). He had unfortunately left a "lift" of coal overhead, and this fell suddenly; it should have been "cropped."	–	1	–	–	–
„ 13	20	Black vein, Risca	Ditto	T. W. Rhodes	Benjamin Hammond.	Collier	30	Heavy fall of stone from roof	–	1	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Names.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof and Coal.	In Shafts.	Miscellaneous.	Above ground.
1864. April 16	21	Nelson, Forest of Dean.	Gloucestershire	Osmond Barrett - -	Charles Hodges -	Haulier -	27	He was bringing to the pit bottom a set of loaded tubs, and was riding between two of them, when his head came in contact with the collar of a pair of timbers, and he was immediately killed. When I examined the colliery I certainly found the main road too low just in that place.	–	–	–	1	–
„ 21	22	Fire-clay, Rhymney.	Monmouthshire	Rhymney Iron Company -	Timothy Timsley -	Hewer -	30	A shot "failed," and he returned to examine it and foolishly drove a steel pricker into the ramming, when it went off and deprived him of life. A copper tool might have saved him. He was working for fire clay only, but as a thin leaf of coal lies directly under it, I have inserted it here as a colliery accident.	–	–	–	1	–
„ 25	23	Paulton Engine Colliery.	Somersetshire -	Wm. Evans and Co. -	Henry Churchill -	Collier -	50	Fall of roof in consequence of two joints at right angles to each other, which let a heavy mass of shale drop down without any warning whatever.	–	1	–	–	–
„ „	24	Tredegar No. 5 pit.	Monmouthshire	Tredegar Iron Company -	Evan Protheroe -	Collier -	20	Fall of stone from roof, which cut right into his brain.	–	1	–	–	–
„ 27	25	Cwmnantddu, Abersychan.	Monmouthshire	Ebbw Vale Company -	John Stockham -	Banksman -	39	He went down the pit to bring up some rails, (a duty he was not called on to perform,) and fastened six of them in the cage; but in coming up the lashing chain broke, and he was forced out of the cage, fell down the shaft and was killed.	–	–	1	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof and Coal.	In Shafts.	Miscellaneous.	Above ground.
1864. April 30	26	Ty Trist, Tredegar.	Monmouthshire	Tredegar Iron Company -	James Davis -	Engineman	22	The fly-wheel of the underground engine suddenly flew to pieces; one of which smashed the steam-pipe, and the poor young man was scalded to death.	–	–	–	1	–
May 6	27	Terrace pit, Rhymney.	Glamorganshire	Rhymney Iron Company -	George Hughes -	Shifter -	67	Slipped and fell under a tram as he was walking down the side of the horse-way with the haulier, and received an apparently slight injury; but in the end it caused his death on the 28th of June. The poor old man was worn out by labour and had not strength to get over the shock.	–	–	–	1	–
" 7	28	No. 15 pit, Ebbw Vale.	Monmouthshire	Ebbw Vale Iron Company	David Jones -	Roadman -	24	Explosion of fire-damp. He was set to watch that point until they had restored the ventilation (interrupted by a fall), when, after telling a workman to retire, he actually himself walked into the body of gas, exploded it, and was killed on the spot; yet he was a man of remarkable attainments.	1	–	–	–	–
" 11	29	Varteghill, Pontypool.	Monmouthshire	John Vipond and Co. -	Jesse Smith -	Fireman -	32	Severely hurt this day by getting in the way of the descending cage at the bottom of the shaft (where he certainly had no possible right to be); of which injuries he died on the 13th of June following.	–	–	1	–	–
" 28	30	No. 6 pit, Victoria	Monmouthshire	Ebbw Vale Company -	David Davis -	Roadman -	55	He was sitting down in the No. 9 cross-heading, when a fall of roof (caused by a slip) came suddenly and killed him.	–	1	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof and Coal.	In Shafts.	Miscellaneous.	Above ground.
1864. May 28	31	No. 6 pit, Victoria.	Monmouthshire	Ebbw Vale Company -	George Harris -	Collier -	38	A fall of coal in another part of the same pit as the above, and on the very same day. It was the "three quarter coal," and he was occupied in holing it when the fall came and killed him. It certainly was not sufficiently spragged.	–	1	–	–	–
June 1	32	Glyn pits, Pontypool.	Monmouthshire	Ebbw Vale Company	Henry Vaux - John Stephens - John Thomas - William Hill -	Ditto - Haulier - Collier - Ditto -	17 16 69 53	Lost their lives by explosion of fire-damp in the Rock Vein coal, in consequence of both doors being left open by the haulier, who was himself one of the killed. The fresh air was thus entirely cut off from the face of the work in the heading.	4	–	–	–	–
,, 21	33	Newbury -	Somersetshire -	Steeds, Pilditch, and Co. -	William Adams -	Sinker -	30	Killed in the new sinking pit in consequence of a fall of shale of great weight coming away suddenly from the side, tipping the "tack" (cradle) at a terrible angle, and throwing Adams down into the sump, where he was drowned. The fall of stuff was occasioned by a "slip" in the strata. It is the custom of the county to have a second "tack" just below whilst walling, and there ought to have been one in the present instance.	–	–	1	–	–
,, ,,	34	Garn, Blaenavon	Monmouthshire	Blaenavon Iron Company	William Smith -	Haulier -	15	Fell under trams on which he was riding, sitting on the cross in front, and was so injured that he died two days after.	–	–	–	1	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions.	Falls of Roof and Coal.	In Shafts.	Miscellaneous.	Above-ground.
1863. July 5	35	Risca - -	Monmouthshire	T. W. Rhodes - -	William Lewis -	Haulier -	23	Killed by fall of shale from the roof of the black vein.	–	1	–	–	–
„ 6	36	Terrace, Rhymney.	Glamorganshire	Rhymney Iron Company -	Thomas Cronen -	Gobber -	21	Killed by a fall of rubbish in a part of the colliery where he had no business whatever; he ought at the time to have been gobbing in front of the face of work to which he belonged.	–	1	–	–	–
„ „	37	Coity, Blaenavon	Monmouthshire	Blaenavon Iron Company	Thomas Jones - James Parry -	Haulier - Shoeing smith.	49 64	They were descending the pit (to shoe the horses) against a loaded tram, when the cage caught in the lower "fans" and jerked them out. They fell 14 yards and Jones was killed on the spot, and Parry so injured that he died the next day.	–	–	2	–	–
„ 27	38	Mydylog, Nantyglo.	Monmouthshire	J. and C. Bailey - -	John Rees -	Collier -	46	Fall of roof which so injured him that he died on the 7th September.	–	1	–	–	–
Aug. 3	39	Rock Vein, Machen.	Glamorganshire	Machen Coal Company -	William Davis -	Collier -	28	Killed by fall of stone from roof - -	–	1	–	–	–
„ 1	40	Newbury pit -	Somersetshire -	Steeds, Pilditch, and Co. -	John James - -	Carting boy	22	Killed by crush of tubs - - -	–	–	–	1	–
„ 11	41	Glyn pit, Pontypool.	Monmouthshire -	Ebbw Vale Company -	Henry Churchill - Daniel Moses -	Collier - Haulier -	34 26	Killed by the fall of roof at the intersection of a stall with the heading. They upset a loaded tram into the stall, but in doing so knocked out the timbers.	–	2	–	–	–
„ 15	42	Old Welton -	Somersetshire -	Old Welton Coal Company	William Norman -	Collier -	29	Fall of coal. Whilst he was getting out the bottom coal the top lift fell and killed him. That top coal should have been "cropped." There is no end of this class of accident, notwithstanding that I never cease to show them that overhanging masses should be taken down in time	–	1	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. Aug. 16	43	No. 9 pit, Ebbw Vale.	Monmouthshire	Ebbw Vale Iron Company	Thomas Cooper	Onsetter	25	Killed by a piece of coal which fell from an ascending loaded tram.	–	–	1	–	–
" "	44	Kidnalls, Forest of Dean.	Gloucestershire	Executors of John Morrell	William Kear	Collier	20	A piece of coal fell from the side whilst he was filling a tram in the face of the main road. The overman was with him at the time and no danger was apparent or apprehended; however, the coal burst suddenly off by superincumbent pressure and killed him.	–	1	–	–	–
" 23	45	Risca Colliery	Monmouthshire	T. W. Rhodes	Michael Lynch	Haulier	13	Fell under a tram on the black vein surface tip and was killed.	–	–	–	–	1
" "	46	Mardy pit, Rhymney	Monmouthshire	Rhymney Iron Company	Evan Morgan	Ditto	15	Fell out of cage in descending when about twenty yards from the bottom. It was a good cage and had holding-on bars. Also four other persons were with him, but they were unable at the time to ascertain the cause of his fall. However, as during the descent the onsetter observed a mass of coal on the bottom which would have prevented the cage reposing horizontally, he signalled to stop, and it is surmised that the boy supposed they had arrived at the bottom and stepped out and was killed.	–	–	1	–	–
" 31	47	Rose in Hand, Forest of Dean.	Gloucestershire	J. and H. Harris	John Harrison	Collier	25	So injured by the fall of a "bell mould" that he died on the 5th of September.	–	1	–	–	–
Sept. 5	48	Yard pit, Rhymney.	Monmouthshire	Rhymney Iron Company	Joseph Morgan	Ditto	18	Watching to keep his comrades safe whilst a shot went off, he was himself so injured by a fall of coal detached by the concussion that he died on the 1st of November.	–	1	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.
1864. Sept. 7	49	Elled, Blaina -	Monmouthshire -	Levick and Simpson -	Martin Bond -	Sinker -	47	Fall of shale from roof in the level. In endeavouring to break away the snout end of a long and heavy piece of shale which rested on two props, it suddenly rolled over and killed him.	–	1	–	–	–
,, 23	50	Old Welton Pit -	Somersetshire -	Old Welton Coal Company	Henry Gregory Coller.	Hewer -	42	Fall of roof whilst engaged in benching the 26-inch vein.	–	1	–	–	–
Oct. 6	51	Risca Colliery -	Monmouthshire -	T. W. Rhodes - -	George Norris -	Collier -	39	Fall of stone in his working place in the rock vein coal.	–	1	–	–	–
,, 19	52	Machen Colliery	Glamorganshire -	Machen Coal Company -	John Morris -	Haulier -	14	Fell under a tram, which passed over him and occasioned such injuries that he died on the 31st of the same month.	–	–	–	1	–
,, 22	53	Lightmoor, Forest of Dean.	Gloucestershire -	Henry Crawshay - -	Jacob Clutterbuck	Collier -	30	Injured by a heavy fall of roof in one of the "Lowery" stalls, occasioning such injury to the spine that after lingering two months he died on the 26th of December. The place was well enough timbered, but an undetected slip intervened and no doubt caused the fall.	–	1	–	–	–
Nov. 9	54	Bwlchygarn Pits	Monmouthshire -	J. and C. Bailey - -	T. W. Challenger -	Collier -	50	Whilst barring down a "Brass" (pyrites) in the "Big vein," a ton of coal rolled over, and as a prop was in the way he could not escape. The coal was followed by a fall of the "clod," which broke in his breast bone, and wounded the lungs in such manner that he died before midnight.	–	1	–	–	–
,, 9	55	Bideford Culm pit.	Devonshire -	Bideford Company - -	William Francis -	Miner -	31	A sudden run of fine dry culm came down and smothered him before he could be withdrawn.	–	1	–	–	–
,, 23	56	Old Coal, Blaina	Monmouthshire	Levick and Simpson -	James Nicholas -	Collier -	40	Fall of shale from the roof in a roadway.	–	1	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof and Coal.	In shafts.	Miscellaneous.	Above ground.
1864.													
Nov. 28	57	Kingswood	Gloucestershire	Kingswood Coal Company	Isaac Bryant George Pool	Collier Ditto	31 28	They, with four others, went down to commence work in a close man hudge. Through derangement of the indicator, and absence of proper signals, they went three or four feet too low, and finding themselves in the sump, Bryant and Poole were either pushed out of the hudge or struggled themselves out, and were drowned. The other four, by remaining in, escaped.	–	–	2	–	–
,, 29	58	Wellsway pit	Somersetshire	Countess of Waldegrave	Uriah Ferris	Labourer	40	Fall of a heavy beam on the surface in consequence of the lashing being too weak, whereby Ferris received such injuries as to cause his death, which took place in the Bath Hospital on the 9th of December.	–	–	–	–	1
,, 30	59	Cinderpit, Beaufort.	Monmouthshire	J. and C. Bailey	William Evans	Collier	42	Enormous fall of roof over the "old coal." Perhaps he was cutting away props to get at the blackband lying immediately over the coal.	–	1	–	–	–
,, ,,	60	New pit, Blaenavon.	Monmouthshire	Blaenavon Iron Company	William Reen	Ditto	15	Killed by fall of stone from roof whilst getting a prop ready to set under it.	–	1	–	–	–
								Total number of killed - 67	6	33	13	12	3

List of Fatal Colliery Accidents—*continued.*

RECAPITULATION.

Total number of separate accidents reported in the year 1864 - - - 60
Total number of persons killed by those 60 separate accidents - - - 67

Whereof 6 deaths were occasioned by explosion of fire-damp.
„ 33 „ „ falls of coal and stone.
„ 13 „ took place in pit shafts.
„ 12 „ arose from miscellaneous causes under ground.
„ 3 „ occurred on the surface.

Total - 67 deaths, as enumerated and described in the List.

COMPARATIVE TABLE OF THE LAST FOUR YEARS.

In 1861, 4 persons lost their lives by explosion of fire-damp, at the same time that the total number of deaths amounted to - - - - - 70
„ 1862, 2 „ „ „ „ „ 60
„ 1863, 3 „ „ „ „ „ 60
„ 1864, 6 „ „ „ „ „ 67

LIONEL BROUGH,
Inspector of Coal Mines for the South-western
Division of Great Britain.

NON-FATAL COLLIERY ACCIDENTS DURING THE ENTIRE YEAR OF 1864.

Of these there occurred 99 in all, attended, more or less, with injury to the persons employed, in manner as tabulated below :—

13	accidents by fire-damp, -	whereby	16	men and boys were burned by explosion or bruised and contused by its expansive force.
51	„ by falls of coal and stone,	„	56	men and boys suffered from fractured limbs, or in other ways were wounded and hurt.
5	„ in shafts,	„	5	men and boys underwent fracture of bone, or received other injuries.
27	„ by miscellaneous causes,	„	29	men and boys suffered more or less from fracture, from burning by explosion of gunpowder, and from other causes of an equally grave and serious kind.
3	„ occurred on surface,	„	3	men and boys were maimed, fractured, or hurt.
99	accidents, whereby		109	persons were injured.

But, it is gratifying to have to record, that nearly all the 109 so injured, have since been restored to strength and usefulness, or are now progressing towards recovery.

LIONEL BROUGH,
Inspector of Coal Mines as aforesaid.

LIST of the FATAL ACCIDENTS in IRONSTONE MINES and LOSS of LIFE arising therefrom, in the SOUTH WESTERN DISTRICT of GREAT BRITAIN, during the Year ended the 31st of December 1864.

This Division of the Ironstone Mines of Great Britain comprises all Monmouthshire, Gloucestershire, and Somersetshire; also, parts of Glamorganshire Breconshire, and Devonshire.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof and Ironstone.	In Shafts.	Miscellaneous.	Above-ground.
1864. Jan. 1	1	Bottom vein, Beaufort.	Breconshire - -	J. and C. Bailey - -	John Warners -	Miner -	14	He was working with his father and a shot had been prepared in a stall in the red vein mine, when, in order to make room for the fuse he drove in the wire, which passed beyond the powder and came in contact with some silicious substance, for the charge exploded and killed him on the spot. Another instance of death occasioned by making use of steel instead of copper.	–	–	–	1	–
Feb. 3	2	Cwm Lucu, Pontypool.	Monmouthshire -	Ebbw Vale Company -	David James -	Haulier -	54	Crushed by a loaded tram which ran wild in the spotted vein mine.	–	–	–	1	–
„ 9	3	Mine Patch, Blaenavon.	Monmouthshire ..	Blaenavon Company -	John Painter -	Miner -	40	Fall of top rubbish, killing him on the spot; this overhanging mass should have been cropped.	–	1	–	–	–
„ 18	4	Nantymelyn, Rhymney.	Monmouthshire ..	Rhymney Iron Company -	John Rees - -	Ditto -	14	In descending the pit with other operatives his clothes caught in the cistern pipe and he fell to the bottom. They had no right to go down the pit, as the rule is to pass to their work through the slope horseway. It was alleged that the mine was not worked in conjunction with coal; nevertheless I insert it in this list as it is an ironstone mine above the millstone grit, therefore, in my opinion, belonging to the coal measures.	–	–	1	–	–

List of Fatal Ironstone Mine Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.				
									Explosions.	Falls of Roof and Ironstone.	In Shafts.	Miscellaneous.	Above-ground.
1864. Mar. 30	5	Michael Sirhowy	Monmouthshire	Ebbw Vale Company	Wm. Lloyd	Miner	18	Fall of working ground whilst holing in "the black pins." The fall was occasioned by a "slip."	–	1	–	–	–
April 2	6	No. 8 pit, Sirhowy	Monmouthshire	Ebbw Vale Company	Jas. Lloyd	Miner	60	Fall of stone from face of stall. It was a piece of mine ground which rated off in consequence of a concealed "slip."	–	1	–	–	–
June 10	7	No. 1 pit, Blaina	Monmouthshire	Levick and Simpson	David Morgan	Miner	24	Fell out of carriage and was killed. It was stated that this accident occurred on a mine not worked in connection with coal; but I have thought it my duty to record all accidents occurring in the ironstone mines of the coal measures, whether they be high up or low down in the series.	–	–	1	–	–
" 16	8	Goughsvein, Victoria.	Monmouthshire	Ebbw Vale Company	Thos. Medlicot	Mason	34	Killed by fall of stone whilst arching in the drift.	–	1	–	–	–
" "	9	No. 9 pit, Sirhowy	Monmouthshire	Ebbw Vale Company	Jno. Griffiths	Sinker	43	Whilst descending he fell out of a bucket in consequence of "fouling" a lashing chain hanging loose in the pit.	–	–	1	–	–
" 21	10	No. 7 pit, Tredegar	Monmouthshire	Tredegar Iron Company	Elias Tucker	Miner	14	Fall of stone whilst working with J. Simmonds. The mass that fell broke suddenly over the timber.	–	1	–	–	–
July 2	11	New pit, Blaenavon	Monmouthshire	Blaenavon Iron Company	Jas. Gregory	Miner	31	Fall of ground which so injured his knee as to render amputation necessary, but he died under the operation.	–	1	–	–	–

List of Fatal Ironstone Mine Accidents.—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost.				
									Explosions.	Fall of Roof and Ironstone.	In Shafts.	Miscellaneous.	Above ground.
1864. July 16	12	No. 7 pit, Tredegar.	Monmouthsnire	Tredegar Iron Company -	Daniel Lewis -	Miner -	23	Had bored a hole, but just before firing it he commenced to fill a tram close under the very spot, when suddenly about half a hundred weight of stone fell and killed him immediately.	–	1	–	–	–
Sept. 1	13	No. 2 pit, Sirhowy.	Monmouthshire	Ebbw Vale Iron Company	Samuel Phillips	Miner -	35	In ascending the pit he jumped off the cage probably thinking he was still close to the bottom. Just before he had got on to the carriage he had become alarmed at the fall of water from the tank in consequence of the valve getting gagged, and no doubt had not recovered his presence of mind.	–	–	1	–	–
„ 29	14	No. 5 pit, Tredegar.	Monmouthshire	Tredegar Iron Company -	Charles James -	Miner -	23	Killed instantaneously by a very heavy fall of stone.	–	1	–	–	–
Oct. 10	15	Big pit, Abersychan.	Monmouthshire	Ebbw Vale Company -	James Mills -	Miner -	55	Fall of roof over ironstone which so injured him that he died on the 12th.	–	1	–	–	–
Dec. 17	16	No. 3 pit, Sirhowy.	Monmouthshire	Ebbw Vale Company -	Thomas Meredith -	Haulier -	14	He started to take a loaded set of trams out of the level, but was soon after found doubled up under them, dead.	–	–	–	1	–
„ 23	17	No. 5 pit, Beaufort.	Monmouthshire	J. and C. Bailey - -	George Moral -	Miner -	37	Killed by a fall of roof whilst holing in the red vein mine. There was a dangerous slant in the measures, and although he was aware of it he had not time to get away when the fall came.		1	–	–	–
									–	10	4	3	–

List of Ironstone Mine Accidents—*continued.*

RECAPITULATION.

Total number of accidents reported in the year 1864 - - - - 17
Total number of persons killed by those 17 separate accidents - - - 17

Whereof 10 deaths were occasioned by falls of rubbish, stone, shale, and iron mine.
,, 4 ,, took place in pit shafts.
,, 3 ,, resulted from miscellaneous causes under ground.

Total - 17 deaths, as recorded in the Fatal Accident List.

Comparative Table of the last Four Years.

In 1861, the total	number of	persons killed	in the Ironstone	Mines of	the district	amounted to	20
,, 1862,	,,	,,	,,	,,	,,	,,	10
,, 1863,	,,	,,	,,	,,	,,	,,	19
,, 1864,	,,	,,	,,	,,	,,	,,	17

Note.—The production of native Ironstone in 1864 appears to have been considerably in excess of all previous years of inspection in the South-western District.

Lionel Brough,
Inspector of the Ironstone Mines of the South-western
Division of Great Britain.

Non-fatal Ironstone Mining Accidents during the Year 1864 - - 13

These accidents were attended with injury, more or less, to the persons employed in manner as tabulated below:—

10	accidents by falls of stone, shale, and ironstone,		whereby 10	persons suffered from fracture, or were otherwise wounded and hurt.
1	,,	in a shaft,	,, 1	person broke his leg.
1	,,	by miscellaneous cause,	,, 1	person was severely injured.
1	,,	on surface,	,, 1	person had his leg broken.
13	accidents.		13	persons injured.

I am glad to be able to state that the above thirteen persons are all recovered, or recovering.

Lionel Brough,
Inspector of Ironstone Mines as aforesaid.

Mr. Baker's Report.

Report on the Inspection of Mines in the South Staffordshire and Worcestershire Division for the Year ended the 31st December 1864.—By James Philip Baker, Esq.

Sir, Wolverhampton, February 28, 1865.

The loss of life.

I regret that the "List" of fatal accidents, which I have the honour to enclose with this Report, shows that the death-rate during the year 1864 has slightly gone up. The total loss of life in coal mines in 1863 was 110, and the total number of deaths in such mines in this district for the past year was 119, which, however, is somewhat below the average of the last four years; and also a great diminution in the loss of life, when the average of former years is taken into consideration. Nevertheless, I am fully convinced that the number of accidents and the fatalities arising therefrom may be still further diminished.

Number of Lives lost.	Explosions.	Falls.	In Shafts.	Miscellaneous.	Above ground.	Total.
Annual average of 4 years ended 1863 - -	10·75	71·75	30·75	10·25	2·25	125·75
In the year 1864 - - - - - -	12	51	47	3	6	119

The foregoing Table shows that the death-list has been chiefly augmented by shaft accidents, three of which, namely, Nos. 2, 55, and 77 are of a most extraordinary character; and, I believe, unprecedented in the annals of coal mining in this inspection district, and to which it will be my duty to advert more particularly hereafter.

Besides the 119 deaths, 218 persons were more or less injured during the same year, most or all of whom have returned to their employment, or are now fast recovering. Some of these cases were of a very slight character. Pinched fingers and other injuries of a similar nature are now reported.

The following statement shows the number of persons employed in and about the coal mines of South Staffordshire and Worcestershire, the quantity of coal raised, and the proportion of lives lost by the accidents for the year ended 1864.

Number of Persons employed as per Census of 1861.	Computed Number of Persons employed.	Computed Quantity of Coal raised.	Separate Fatal Accidents.	Lives lost by the Accidents.	Persons employed per separate Fatal Accident.	Persons employed per Life lost by the Accidents.	Tons of Coal raised per separate Fatal Accident.	Tons of Coal raised per Life lost by the Accidents.
25,235	26,620	10,206,000	95	119	280·21	223·697	107,431	85,764

There are 540 collieries in this inspection district, most of which have been in operation during the past year. I estimate the amount of coal raised at these collieries at 10,206,000 tons, as shown in the above tabular statement.

This quantity includes the coal consumed on the collieries, the colliers allowance coal, &c., and also the residue of the screened coal which is burnt as *waste* on the pit mounts, and which I estimate at 1,344,800 tons.

Towards the end of the year 1863, and during the spring of 1864, the iron trade revived, which greatly increased the consumption of coal; consequently every available *mine* in the district was again in operation, in order to supply the excessive and increasing demand, which continued till about the middle of the year and then began to decline.

The Colliers' strike.

The colliers' "strike" immediately followed, and was confined for some weeks to the southern part of the district, but before it closed it had extended by degrees over a large portion of the coal-field, causing serious damage to the mines, great loss to the colliery owners and the public, and brought about a lamentable amount of misery and destitution amongst the mining population.

To comment upon each of the 119 fatalities recorded in the "List" would unduly lengthen this report. I purpose, therefore, to notice some of the worst cases which have occurred within the year in question, commencing first with explosions. The mines of both coal and ironstone give out fire-damp more or less throughout the entire district; but with ordinary precaution fatal explosions would seldom be heard of.

How explosions sometimes occur.

Twelve lives have, however, thus been lost during the year, and a much larger number injured. Of the persons killed, two deaths took place at the Brownhills Colliery on the 2d of May. On the morning in question, the workmen assembled at the pit as usual, and at the proper time began to descend, leaving the "deputy," John Williams, (whose duty it was to have preceded the colliers and examined the mine in accordance with the 17th special rule,) upon the bank. The unfortunate men, however, proceeded along the gate-road of the pit, but before they reached the extremity a frightful explosion occurred, killing two workmen on the spot and seriously injuring several others.

Fortunately, most of the men were behind in the gate-road, otherwise the results might have been of a very calamitous character. By your directions, proceedings were subsequently taken against "Williams" for a violation of the 17th special rule, and he was committed to gaol for two months, without hard labour.

No. 62 was a very painful case. The two sufferers, D. Morgan and H. Keay, were severely burnt by an explosion of fire-damp whilst engaged cleansing an air-way. The evidence given at the inquest by "Keay's" brother and the "deputy," went to show that orders were given to the deceased persons not to go beyond the junction of the air-way; that no trace of gas was found when they commenced work, and that the injured man "Keay," just before his death, stated that "Morgan" took the candle out of his hand, went beyond the point named, and unexpectedly met with gas and fired it.

On my official examination of the pit after the explosion, I travelled the air-way and found gas in an inflammable state at the junction; and from the general state of the workings I came to the conclusion that the accident was attributable to inadequate ventilation, and gave evidence to that effect at the inquest.

The coroner in summing up the case adverted to the impossibility of getting any reliable evidence as to how the explosion happened, as the only persons who were present in the pit at the time of the accident were dead, but it was clearly shown that there had been some neglect in the management of the pit. The jury, however, returned a verdict of accidental death, coupled with a censure upon Mr. Thomas Jeavons, one of the owners, and Samuel Cadman and James Keay, the managers of the mine. In conveying the jury's expression of opinion the coroner observed that there had been a shameful neglect of duty on the part of all the three men, and that the jury considered them morally responsible for the death of the two deceased persons, and would have returned a verdict of manslaughter against them had they not been so unfortunately circumstanced as to the evidence.

No. 27. In this case two men (sinkers) were employed to do some repairs in a pit-shaft in the Moat Colliery, and in order to accomplish the work it was necessary to put a scaffold in the shaft to stand upon, which the "head sinker" particularly requested the unfortunate men to keep sufficiently open for ventilation. Nevertheless, it appeared they disregarded his instructions, and soon after he left the pit an explosion took place, precipitating the poor fellows to the bottom of the shaft, and killing them both instantly. The shaft was carefully examined before the scaffold was erected, but no trace of gas was discovered. Due attention to orders would in all probability have prevented this accident, as there was a good current of air passing before the erection of the scaffold. But it would, however, be better to use locked safety-lamps in all such cases instead of candles, and none but experienced workmen should be employed.

No. 70 occurred at the Willingsworth Colliery. Several persons were severely burnt, two of whom have since died. I visited the colliery next day and examined the pit in company with the proprietor and his agent. I found fire-damp at the place where the explosion had occurred the day before, and the ventilation very feeble; but that part of the pit was not then in operation. In the afternoon of the day on which the accident took place a collier was engaged cutting roof coal in the "gob or waste," when it was supposed that he pierced a small reservoir of gas in the roof, which rushed out into the air-current and ignited at one of the workmen's candles beyond the "waste." Evidence was given at the inquest by several of the workmen that the ventilation of the mine was good at the time of the explosion, that the outburst of gas was so violent, and the distance between the "waste" and the other workmen's candles so short, that it fired before the air-current could neutralize it; which I venture to think was by no means improbable, as the "waste" and the candles were only a few feet apart.

The owner of the colliery informed me that in one of these cases there was scarcely any bed-linen at the house of one of the sufferers. Several instances of a similar character have recently come under my notice, and it is therefore no wonder if injured persons so circumstanced sometimes succumb. It is to be feared that not a few of the deaths during the past year are to some extent attributable to such causes, and the absence of sufficient and proper nourishment.

The probab cause of many death

No. 35 was a careless adventure. The deceased recklessly went into a "headway" and fired some gas, which burnt him severely. He was too impatient to wait for the deputy's examination, and thereby brought about the injury which afterwards proved fatal to him.

Of the three remaining cases two were owing to disobedience to express orders; but the other was the result of accident.

Falls.

This cause of death has again undergone decline when compared with 1863.

The diminution in the number of lives lost in 1864 was no doubt to some extent attributable to the "strike" which took place at collieries near and around Dudley. There have been 51 fatal accidents, of these 26 occurred in "thick coal" mines, 4 of which happened in mines where the coal is worked in two separate divisions; 15 took place in the new-mine and fire-clay and bottom coals, and 10 in the thinner mines. Ten of the 51 deaths were clearly shown to have been caused through insufficiency of timber. Four "pikemen" were killed owing to their own neglect to "sprag" or "spurn" the coal whilst holing. Five were the result of disobedience to express orders, and disregard of the special rules. The 32 remaining fatalities were chiefly brought about by accidental causes; yet I do not hesitate to say that some of these might have been prevented by a more judicious and liberal use of timber props and bars. So remarkable a change in relation to "falls" is very gratifying; but after all the death-rate under this head is still too high, and a further diminution is desirable, and it might I believe be effected by working the *thicker* seams in two or more divisions, and by superadding to abundant and proper supplies of timber incessant supervision on the part of managers, charter-masters, and their deputies; otherwise, I fear the improvement is too promising to last.

How still further to lessen the death-rate.

With regard to the question of the best mode of working the "thick coal," a good deal of interest has been excited in this district during the past year by an able paper on the *yield* of the ten-yard coal, and the best mode of increasing it, having regard to the *safety* and economy of the working, read by Rupert Kettle, Esquire, Judge of the Worcestershire County Court, at one of the meetings of the Dudley and Midland Geological and Scientific Society: in which he showed the great advantages in respect to *yield*, and the *safety* of the *workmen* of getting this seam in separate divisions, as compared with the usual *pillar* and *stall* mode of working. The discussion on Mr. Kettle's paper is still pending.

No. 42 in the list occurred at the Cooper's Bank Colliery, in a thick coal rib and pillar pit, by which two persons, the deputy and another workman, were instantly deprived of life.

On my examination of the pit, I found an immense fall of coal in the skip road near the "stall." The road was by no means too wide, but there was a scarcity of timber at this point, especially for skip roads in such workings.

Scarcity of timber prop &c.

If the place had been well propped and the roof barred, I think the accident (if not entirely averted) would have been less fatal.

No. 57 was also a very lamentable accident. The two unfortunate colliers, a man and a boy were engaged "holing" under a pillar of coal which had been left to support the roof, and when they had nearly completed their task a "bump" or subsidence of the superincumbent strata suddenly took place, and forced a heavy piece of coal off the pillar on the gate-road side.

Reckless working.

From the evidence given at the inquest, it was clearly shown that the sufferers had been too reckless whilst in the act of removing the last "spurn" from under the pillar.

No. 75 records another very sad event, which exhibits the danger of the colliers' avocation. The pit company had just sat down to dinner at the usual place in the gate-road, where danger was least expected, when upwards of a ton of coal fell off the solid rib from a slip, completely burying several of the workmen, which afterwards proved

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fatal in two cases. I made an inspection of the pit soon after its occurrence, and found that the fall was the result of accident. The other part of the mine however was in so dangerous and unsafe a condition, owing to overhanging masses of fractured coal and insufficiency of timber, that I felt it my duty to direct the owner and butty not to allow the colliers to resume work until the mine should be rendered safe.

Accident No. 76. In this case the timber settings were too narrow, and too few in number. Timbered roads under ground should be of ample dimensions in order to prevent the possibility of a "skip" coming into contact with the timber props and bars, and the settings should be nailed together by slabs or boards, a precaution I recommended the owner to adopt during my examination of the pit.

No. 92. In this instance the timbering had been too long delayed. The fall of coal took place whilst the "deputy" was in the act of standing a tree, slightly injuring himself and killing a young man at work in the "band." The bandsmen ought to have been withdrawn from the spot till proper and sufficient timber had been set up.

Shaft accidents.

No. 1 in the list occurred at the Ward Colliery. Two persons were engaged removing air-pipes, and whilst ascending the pit-shaft with a cage load, some of the pipes caught under the frame-work at the pit-top and snapped the wire rope, precipitating them to the bottom of the shaft. If the air-pipes had been kept upright on the cage the accident might have been prevented. The rope was subsequently tested and sustained a strain equal to six tons (6 tons).

Accident No. 2, Bridge End Colliery. This is, perhaps, one of the most remakable accidents on record, indeed it is the only one of its kind that has come to my knowledge.

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On the morning of the 11th of January whilst six workmen were descending the pit shaft the horse driver went into the stable upon the pit bank to bridle the "horse," when the animal immediately turned round, knocked the driver down, and rushed out in the direction of the pit-mouth, slipping headlong into the shaft, down which he fell with horrible and tremendous force, and striking the skip upon which the unfortunate men stood, severed the coupling link of the band-chain, and thus precipitated them to the bottom where they were afterwards found dead and sadly mutilated.

At the pit in question the usual mode of winding is practised, *i.e.*, loose skips are employed instead of guides, cages, lifting wickets, &c. If these latter had been in use this lamentable accident would have been prevented.

During the last few years a very considerable number of pits have been geared up with guides, &c., which improvement is still, though but slowly, going on.

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t-shafts.

I am gratified to be able to state that I have at length prevailed upon several colliery proprietors and agents to construct a permanent fence for the pit shafts, which is attached to the pit waggon, and travels to and fro with it, and thus protects the pit mouth at all times, whether operations are going on or not.

The idea of a travelling fence first struck me during my inspection of a pit in the Chillington Colliery, where the agent had made provision in accordance with the special rules to prevent the skips falling into the shaft when the waggon is off. I immediately communicated with the Chillington Company on the subject and suggested a plan for the construction of a secure and permanent travelling fence, which suggestion they kindly acted upon and are now carrying it into effect at their collieries.

Several mine agents in that locality have already adopted the plan and made some improvements thereon. The cost of this simple apparatus is about 3*l.* 10*s.* or 4*l.*

The general adoption of such a provision would not only put an end to accidents like the Bridge End Colliery catastrophe, but prevent persons accidentally falling into pit-shafts from the surface.

There are several cases recorded in the "list" where persons have lost their lives by falling into the pit-shaft from the surface, namely, Nos. 20, 22, 26, 43, 88, and 99; three of which are due to carelessness on the part of the deceased persons themselves; but none of these could have happened if the pit shafts had been guarded in the way just described, or fitted up with guides, &c.; the absence of which has cost the district twelve valuable lives.

Four workmen lost their lives by falling off the skip or cage whilst ascending or descending. These would have been saved if the deceased persons had used the safety chains.

afety-chain.

Some of the mine agents, and I fear the majority of the colliers, object to use these chains through fear of being drawn over the pulley at the pit top. However, I am glad to learn that they have been the means of saving some of the workmen during the past year.

Accident caused through lax discipline.

Accident No. 10 is a melancholy instance of indifference to danger on the part of the sufferers themselves. Early on the morning of the 26th of January two workmen stepped into the skip to descend the pit shaft at the Hay Green Colliery, and the instant the signal was given to lower, the skip with its living freight was observed by the "banksman" to fall from the coupling chain of the gin rope, thus precipitating the two men to the bottom.

Evidence was given at the inquest that the skip was properly attached to the coupling chain with the main-hook, and also tied with a cord to one of the links thereof, but as there was no breakage found in any part of the "tackle," the jury came to the conclusion that the point of the main-hook accidentally slipped out of the "link," and that the skip was suspended only by the cord when the accident happened.

If the tackle had been examined by the "banksman" or by one of the unfortunate persons their lives would doubtless have been saved.

The special rules of the district require the banksman to properly tackle the skip before he allows persons to descend. In this case, however, the owner of the colliery had neglected to establish special rules, for which offence he was afterwards summoned before the Stourbridge magistrates and fined 1*l.* and the costs.

Accidents Nos. 6, 37, 41, and 89, happened to persons occupied as "hookers-on" at the bottom of the pit-shafts, who brought about their own destruction by improperly standing in the shaft during the ascent of the loaded skips. Such accidents are unavoidable whilst the workmen unnecessarily expose themselves to such danger.

Nos. 81 and 91 were accidents of a distressing character. Two reckless youths who for some unknown purpose went out from their place of work during the night time, climbed over the "fence-guards" at the bottom of the pit shaft, fell into the sump and were drowned.

No. 55. In this unfortunate instance two men (sinkers) were being lowered into a pit-shaft in the Dimmack's Colliery by a horse-gin, but before the poor fellows had descended more than 20 feet the "horse," from some unknown cause, became restive, leaped out of the gin-ring, and broke loose from the horse arm of the gin, carrying a part of it away with the gin-shafts to the stable. The gin-wheel whirled round rapidly, and the two sinkers were precipitated to the bottom, killing them both upon the spot.

Four boys have been killed by over-winding: three at the Eagle Colliery and one at the Netherton Colliery, Nos. 61 and 83 in the "list."

Case 61 was an appalling accident. On the evening of the 12th of July four boys were ascending a pit-shaft about 60 yards in depth at the Eagle Colliery, during which it appeared that an iron "key" belonging to a crank of the valve-gear of the winding engine accidentally slipped out of its place, which rendered the crank useless, and prevented the engineman having control over the machinery. The unfortunate boys were in consequence drawn over the pulley. Three were killed on the spot and the other was seriously injured.

It was proved in evidence at the various inquests that the engineman did not discover the derangement in the valve-gear in time to prevent the accident, and that he applied the "break," but too late to avoid the overwinding.

Nevertheless he ought to have kept the cam disconnected whilst persons were being lowered or raised (especially in a pit so shallow), and he would have thus prevented the accident. Moreover, the fact of the "key" getting loose was not the work of a moment, but it had doubtless been working loosely for some time during the day in question, which the engineman had evidently neglected to observe.

It is possible for all or any of the keys employed in the construction of a winding engine to work loose and fall out, therefore it is necessary, in common with every other part of the machinery, that they should be continually undergoing supervision in order to prevent accident.

This case was thoroughly investigated by three distinct juries, and a verdict of accidental death returned in each case.

Accident No. 83. In this instance one man and a boy were drawn over the pulley at the top of the pit-frame; the boy was killed and the man received severe injuries. The engineman's plea for not stopping the skip at the proper time was, that a sudden volume of steam and dust arose from a heap of "hot coke" and obstructed his view of the pit-top, which statement was corroborated by other witnesses.

Careless engineman.

An indicator and signal bell were, however, attached to this winding engine, both of which were in good working order when the accident happened. If the engineman had paid due attention to these instruments of warning the accident might have been prevented. The coroner's jury, however, returned a verdict of accidental death, but he was subsequently committed by the Dudley magistrates on a charge of manslaughter. He came up for trial at the Worcester winter assizes and was acquitted.

Accident caused by defective winding apparatus. Lamentable loss of life.

The most serious accident in my district during the year, No. 77 in the "list," occurred on Wednesday evening, November 16th, at the Withymoor Colliery, near Rowley Regis, which is worked by Messrs. Edwin and Joseph Nock. A skip containing eight men and boys was being raised at about a quarter past six o'clock, when the chain caught on one of the *horns* of the *drum*, and falling off upon one of the angles of the square "drum-shaft," snapped, and the skip, with its eight occupants, fell a distance of about 70 yards, a length of chain of about 90 yards falling upon them. All the poor fellows were killed on the spot. An inspection of the pit and the "winding apparatus" after the accident rendered the cause of this terrible calamity evident. The chain was a very good one, and on being tested bore a strain of 19 tons 3 cwts. The defect to which this serious waste of life was due was that the *pit-frame* which supported the "pulley," over which the chain worked, had been allowed to get out of the perpendicular to the extent, as I ascertained after the accident, of about 15½ inches, the result of which was, that the chain caught on one of the "horns" of the drum on the side towards which the "frame" leaned, which it was clear had been the case for some time past from the wearing of the horns on that side; and when the accident occurred, as was stated by the man who was working the engine, the chain first caught on the point of one of the horns, and as the drum revolved, fell off upon the square drum shaft, the sharp angle of which, with the force of the concussion, caused it to snap.

Three separate inquests were held in respect to different sufferers, and one of these was presided over by Brook Robinson, Esquire, coroner for Worcestershire; and the other two by Edwin Hooper, Esquire, one of the Staffordshire coroners.

The cause of the accident was clear, but the juries, as is often the case, experienced considerable difficulty in ascertaining who was responsible for the defective state of the winding apparatus; and the result was that each jury returned a verdict involving the charge of manslaughter, but in each case against different persons, the last which sat expressly exonerating the persons committed for trial on the finding of the juries which had sat previously.

It was fully proved by the evidence given at the inquests that the frame which supported the "pulley" had been sinking for a considerable time, owing to a subterraneous fire a few feet below the surface, which caused a continuous subsidence, which had been greater on one side than the other. The frame had often been adjusted in consequence, by raising the depressed "leg." At this, as at other collieries in that part of South Staffordshire, work had been entirely suspended for some weeks, until within a very short time of the fatal occurrence, by a *strike* of the colliers; and there is little doubt that during that time the subsidence had gone on to a considerable extent, and it was proved that, to use the words of the workmen, the leg of the frame had been several times "pecked up" since the working of the colliers had been resumed after the strike. It was evident that grievous neglect had been shown in not more carefully watching the subsidence which was well known to be going on, and in not taking effectual means to make the "pulley" frame firm and true. The difficulty was to see who was responsible for this neglect.

The partner, who took the general management of the colliery, was Mr. Edwin Nock, and up to three weeks before the accident there was a "head engineer," Crispin Southall, who took the general oversight of the engines and winding and pumping apparatus at the various pits, and who stated that the sinking had been going on for twelve months before the accident, but that he left the frame upright and in good order when the colliery started after the strike, and that whilst he was engineer Mr. Edwin Nock had given him strict injunctions to examine it every day.

At the first inquest Mr. Nock stated that after Southall left he employed in his place an engineer named James Leedham, and the jury evidently inferred that this man took Southall's place as head engineer.

Neglect of the engine man.

The engine-man, who was working the engine where the chain broke, was Francis Downing, and in his own evidence he said the frame had been raised two or three times during the month previous to the accident, and was so raised four days before; and he also said that the chain rubbed against the horns and the flange of the pulley, and he acknowledged that he did not consider the machinery safe to work that day, yet he never made any complaint to any one.

The banksman deposed, that when the frame was raised it was done by the orders of Zechariah Mason, the manager of the colliery, and he said he had mentioned the sinking of the frame to "Mason" a few days before the accident. Mason was himself called, and said he knew nothing about the machinery being out of gear, and that no one had told him of it. The result of this first inquiry was a verdict of manslaughter against Zechariah Mason, as manager of the pit, and Joseph Leedham as head-engineer.

First verdict.

At the second inquest, before Mr. Hooper, coroner for Staffordshire, Mr. Edwin Nock, one of the proprietors, stated that Downing, the man in charge of the engine in question, was alone responsible for the machinery at that pit; that Leedham had nothing whatever to do with the pit where the accident occurred; and that Mason was only the "deputy or doggy," and was not responsible for the machinery. The result of this inquiry was a verdict of manslaughter against Mr. Edwin Nock, one of the proprietors of the colliery.

Second verdict.

At the third inquest, also before Mr. Hooper, it was shown that Mason went down the pit on the morning before the accident, and he said that the skip did not touch the side of the shaft. The banksman said he told Mason that there was something wrong about the winding machinery, but did not think there was any danger; but Mason said he had no recollection of being so told. The result of this inquiry was that the jury returned a verdict of manslaughter against Francis Downing, the engineman, specially exonerating Mr. Nock and Leedham and Mason, against whom previous juries had returned verdicts of manslaughter. All four now await their trials at the ensuing March assizes, but the contradictory verdicts of the juries, and still more the accident itself, shows the want in this, as in very many cases, of better discipline, and especially of a more distinct vesting of responsibility in particular persons.

Third verdict.

It is clear that with the plain indications of danger which were manifest, and of which the workmen themselves on one occasion had complained, that more effectual means than merely "pecking up" the frame day by day should have been taken, to render secure that on which the lives of so many persons were daily depending. The cases being now *sub judice*, it is not desirable to say more as to this melancholy accident.

Miscellaneous Accidents.

Nos. 19, 30, and 51, hardly come within the meaning of the Act of Parliament for the Regulation of Mines, but in order to render my returns complete, I have recorded them in the list.

No. 19. In this instance the man was injured by an accidental blow with a "coal-fork," after which he went about visiting his friends, and sometimes travelled long distances. He, however, caught cold and eventually died of tetanus.

No. 30 occurred upon a branch of the South Staffordshire Railway, and is in truth a railway accident.

No. 41. In this case it appeared that the deceased slipped down in the gate-road of the pit. Nevertheless he attended to his work during the day on which it occurred, and till the end of the day following, without making any complaint whatever. There was no external mark or bruise upon his body; but he died within three weeks after the fall, of pyæmia.

Nos. 67, 68, 80, and 94, happened to persons above ground.

Case 67 records the death of the engineman. The deceased was found, in the afternoon of the day on which the accident occurred, sitting upon the "fly-wheel race" of the pumping engine, fearfully mutilated by the machinery. He was immediately removed to his own home, where he only survived the injuries three days.

No. 68 exhibits an act of extreme recklessness. The accident happened at a "blacksmith's shop," upon one of the pit banks of the Bradley Colliery.

Gunpowder.

The blacksmith had charge of the blasting powder stores, and it appeared that he had removed a 28 lb. barrel and placed it in an iron chest in the smithery; and on the day in question while he was filing a piece of hot iron near the chest, a frightful explosion took place which rent the chest asunder, rased the shop to its foundations, and seriously injured the blacksmith. He was removed to the hospital where he lingered some two or three days, and then died of the injuries.

It was fortunate the explosion occurred when the colliers were in the mine, otherwise a more fearful calamity would in all probability have been the result. The placing of gunpowder in proximity to fire is too dangerous to be thought of.

No. 80 was a similar case to 67. In this instance the engine-man was found dead in the crank-pit of the pumping engine. But there was no evidence to show, in either case, how or by what means the two unfortunate men became entangled with the machinery. The coroner's jury returned a verdict of "accidental death" in each case.

No. 94 was a most lamentable case, which proved fatal to another engineman. The deceased had charge of a pumping engine during the night-time, and whilst off his turn he went into a public-house in the neighbourhood, and there became intoxicated.

He returned to the engine in the evening, and fell into some hot water which had just been let out of the steam boiler, and was so dreadfully scalded that he died next day in the South Staffordshire Hospital; the sad result of drunkenness.

None of the other cases recorded in the list require any special notice, as they are sufficiently explained in the list itself.

Several persons who were not employed on the collieries lost their lives last year.

On the 14th of January a man (a stranger) went to the Monmore Green Colliery to warm himself at the hovel fire, and as he was going away from the fire he accidently walked into the pit.

At the Ettingshall Lodge Colliery another man was found dead. It appeared that he sat down by the engine fire, fell asleep, and was burnt to death during the night of the 13th March last.

Two children of the respective ages of 8 and 12 years were killed upon the surface tramways; one at Burnt Tree near Dudley, and the other at Brownhill's Colliery.

Children of such tender years should not be allowed to walk on the tramways.

As these accidents do not come within the meaning of the Act of Parliament for the Regulation of Mines they are not included in the returns.

Three men (colliers), whilst following their employment, fell down and expired. These too are not comprised in the list.

Ironstone Mines.

Twenty-four fatal accidents have occurred during the year in working these mines, involving the loss of 25 lives, which shows an increase of eight deaths when compared with the year previous.

Of the 25 deaths six arose through explosion, 11 were caused by falls, two occurred in shafts, four miscellaneous under ground, and two above ground.

Two of the lives lost by explosions were the result of carelessness, and three were of an accidental character.

No. 6 in the list took place at the Bentley Colliery on the 21st of October, by which Henry Clark was so badly injured that he died in the cottage hospital at Walsall on the 7th of November.

It appears that on the morning of the accident the charter-master and his deputy, during their examination of the mine, found a quantity of fire-damp lodged in the roof of the side of work, after which they cautioned Henry Clark and the other workmen, but did not put up any fence to keep them away, as required by the special rules.

William Lane (charter-master), in his evidence before the coroner, stated that he was aware that by the special rules he was enjoined to fence off all *dangerous* places, but thought he had sufficiently secured the safety of the men by cautioning them.

Evidence was also given by the workmen that the ventilation was very good at the time, that no gas had been seen till the evening before the accident, when an explosion happened and severely burnt two boys also, and that Clark went a few feet only in advance of his work when he fired the gas.

Due attention to the special rules would in all probability have prevented the explosion.

By your authority proceedings were instituted against the charter-master, William Lane; the case was heard at the Willenhall Petty Sessions, before the Reverend G. H. Fisher and R. D. Gough, Esquire, on the 26th December last, when the full penalty of 2*l.* and the cost were imposed.

Falls.

No. 4 and 23 in the list happened above ground.

Accident No. 4. The deceased was employed in an open work on the surface of the colliery, and whilst engaged thereat a fall of earth took place and killed him upon the spot.

No. 23. In this case a labourer was working at a heap of calcined iron ore on the surface when a mass of the ore fell and crushed him to death.

The other accidents by falls require no further remark, as they are sufficiently explained in the list itself.

Miscellaneous.

No. 1 in the list exhibits the foolhardiness of the unfortunate sufferer himself.

It appeared that the deceased, after being frequently cautioned not to do so, rushed into a headway to fetch a crowbar, knowing at the same time that black damp (carbonic acid gas) was present; however he was so determined to recover the crowbar that he penetrated the deadly gas for several yards after his candle had ceased to burn, and thereby lost his life; the result of his own indiscretion and folly.

Accident No. 17 was a most distressing case, which took place on the 5th of November last at the Portobello Colliery. Two workmen, J. Fletcher, the head engineer, and J. Price, an engineman, were lowered into the pumping-pit shaft down to the bottom scaffold for the purpose of changing the bottom *clack* belonging to the pump *trees*. It was proved at the inquests that the banksman distinctly heard the men hammering at the *clack* for nearly an hour, and that when the time generally occupied in performing such work (an hour and a half) had elapsed, he signalled down the shaft but received no reply, that he immediately made an alarm and procured the assistance of several enginemen, that attempts were then made to go down the pit-shaft by different persons, but they could only descend about 30 yards, owing, as they stated, to the presence of *fire stink* which compelled them to return through fear of being suffocated, that means were then used to increase the ventilation in order to clear the shaft of the suffocating air.

Afterwards Joseph Brown and another engineer, M. Collins, went down to the *top lift*, where Brown ramained whilst Collins continued to descend, and at length reached the bottom scaffold, where he found both the men sitting side by side and quite dead; and the work only part done. The candles of those who descended were still burning clearly.

After the bodies had been got up, Brown and Collins went down again to finish the work, but were so affected by the noxious atmosphere that they could not stop to complete it, and gave the signal to be drawn up the shaft; but sad to relate when they had ascended about 70 or 80 yards Collins accidentally caught under one of the stays and was jerked out of the horse, fell down the shaft and was killed. The man Brown however reached the top; but he was insensible when taken off the rope. He was saved by the use of the safety-chain.

The other was also provided with one which Brown put around his body, but he had doubtless in the excitement of the moment neglected to properly fasten it. Otherwise I think his life would have been spared.

The cause of the deaths of Fletcher and Price was doubtless owing to the presence of sulphuretted hydrogen in combination with other gases issuing from an upper seam of coal containing large quantities of iron pyrites, which had spontaneously taken fire in the air-way some distance from, but connected with this shaft, which in this instance reversed the air-current and thus brought the gas into the pumping-pit shaft, the deadly character of which the unfortunate men were evidently unacquainted with, as the flame of the candle would not indicate its presence. The workmen only detect it by its penetrating and disagreeable smell, and by their feelings—such as spasm in the throat, a sort of catching of the breath, coughing and pressure on the chest, &c. These would be sufficient indications for the workmen to retire.

Some such feelings the head-engineer J. Fletcher appears to have experienced the night before the accident when he was let down to prime the bottom "lift." He told one of the workmen that the state of the air had affected his head, and made him sick. But beyond this conversation it seems nothing further was done.

The pit shaft was well ventilated down to the top of the middle lift by an air-way in the fire-clay coal, and where the bucket and clack had generally been changed, in accordance with the special orders of the colliery manager, which, in this instance, the engineer disregarded, in order to accomplish the work in less time, and thereby caused the loss of his own life, and that of another man.

Verdicts of accidental death were returned in each case.

Convictions.

Penalties amounting to 125*l.* 1*s.* were imposed during the year 1864 on certain colliery proprietors, agents, and workmen, for violations of the law, and the special rules thereunder.

Five pounds (5*l.*) of this amount have been paid by your directions to a widow who lost her husband in the New Cross Colliery.

Proceedings were also taken against William Pessoll, a charter-master employed in the Horseley Colliery for a violation of the special rules. The case was heard at the Wolverhampton Police Court, before Isaac Spooner, Esquire, stipendiary magistrate, in March last, when he was convicted, and committed to gaol for six weeks without hard labour.

While inspecting some of the collieries in this district in the course of the year in question I have found many defects in the winding machinery and "tackle," and in some cases the danger appeared imminent, so much so, that I have felt it to be my duty, not only to point out the danger and defects, but to remain upon the spot until they were removed; and in many instances I have found it necessary to give the owners and agents of such collieries the usual notice in writing, as required by the 17th section of the Mines Inspection Act of 1860, which was duly regarded in each case.

Notice given to colliery Owners, &c.

During the year I have received by verbal communication, or by letter, many of the latter having been anonymous, many complaints from workmen. Some of these have upon investigation been found to be entirely without foundation, whilst in other instances there were real evils existing, which, as the result of my inspection, have been in every case remedied.

Education.

With respect to the working of clause 2 of the Mines Regulation and Inspection Act of 1860, which enables boys to be employed in coal and ironstone mines between the ages of 10 and 12 on the production of certificates that they are able to read and write, or that they regularly attend school for a fixed period in each week, I have only again to report that the provision remains in my district virtually a dead letter. I have not met with a single case, during 1864, in which a boy was working under such conditions.

As I have stated in former reports, the rule is to employ no boy under 12 years of age.

I have, &c.
James P. Baker,
Inspector of Mines.

To the Right Hon. Sir George Grey, Bart.,
Secretary of State for the Home Department.

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS of LIFE arising therefrom, in the SOUTH STAFFORDSHIRE and WORCESTERSHIRE DISTRICT, during the Year ending 31st December 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.														
Jan. 4	1	Ward - -	Bloxwich - -	Ward Colliery Company	William Hazlewood J. Barker - -	Collier - Collier -	27 26	Breakage of wire rope. The deceased men were ascending the pit shaft with some air-pipes, which came in contact with the frame at the pit top, and snapped the rope.	–	–	2	–	–	2
" 11	2	Bridge-end -	Pensnett - -	Jackson and Jones - -	J. Barker and five others.	Colliers -	—	Fell part way down pit shaft. A waggon horse walked into the pit, and fell heavily upon the skip in which the deceased persons were descending and snapped the band chain. A permanent fence would have prevented this accident.	–	–	–	6	–	6
" 12	3	Ketley - -	Kingswinford -	Matthews and Bond -	M. Homer - -	Coal loader	42	Fell off the break lever belonging to a coal truck on surface railway.	–	–	–	–	1	1
" 13	4	Wallows - -	Brierley Hill -	Earl of Dudley - -	J. Gardner - -	Pikeman -	25	A sudden fall of coal and roof rock from between two joints in thick coal pit. He died in a few hours after he reached his own home.	–	1	–	–	–	1
" 15	5	Old Brownhills	Walsall - -	W. Harrison - - -	J. Heath - -	Bandsman -	30	Accidental fall of roof rock caused by two slips (in thin coal mine).	–	1	–	–	–	1
" 19	6	Toll Gate -	Bilston - -	W. Grove - - -	J. Foley - -	Hooker-on	42	Struck by a piece of coal which fell down the shaft from an ascending skip whilst deceased was wrongfully standing in or near the bottom.	–	–	1	–	–	1
" 20	7	Old Bearmoor -	Corngreaves -	New British Iron Company	B. Rock - -	Loader -	17	Accidental fall of coal in "the thick coal."	–	1	–	–	–	1
" 23	8	Pelsall - -	Walsall -	Davis, Bloomer, and Co. -	M. Conner - -	Collier -	25	Fall of coal roof (in thin coal mine); injured on the 8th, and died this day.	–	1	–	–	–	1
								Carried forward - - -	–	4	3	6	1	14

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
								Brought forward	–	4	3	6	1	14
1864. Jan. 26	9	Bridge End	Pensnett	J. Raybould	J. Knight	Collier	—	Fell out of the skip whilst descending. The safety chain would have saved this life.	–	–	1	–	–	1
„ „	10	Hay Green	Lye Waste	J. Hickman	J. Cartwright W. Smith	Ditto Ditto	19 25	The skip fell from the foot-hook of the gin-rope whilst the deceased were descending.	–	–	2	–	–	2
„ „	11	Tividale	Dudley	Earl of Dudley	J. Woodhall	Ditto	14	Explosion of fire-damp on the 16th instant. Died this day.	1	–	–	–	–	1
Feb. 2	12	Wallows	Brierley Hill	Earl of Dudley	George Millership	Ditto	15	Accidental fall of coal in "thick coal," holing drift; occasioned through disobedience to orders.	–	1	–	–	–	1
„ 5	13	Capponfield	Bilston	Chillington Company	B. Cox	Bandsman	—	Fall of roof rock in the "new mine coal;" brought about through disobedience to orders, and violation of 33 special rule.	–	1	–	–	–	1
„ 6	14	Nimmins	Willenhall	Dodd and Southan	T. Griffin	Pikeman	30	Fall of coal in "new mine." Deceased left his place of work and went under some holed coal, when a piece fell and killed him.	–	1	–	–	–	1
„ 12	15	Foxyards	Tipton	Messrs. Creswell	B. Wright	Ditto	—	Accidental fall of coal in "thick coal."	–	1	–	–	–	1
„ 13	16	Freemans	Kingswinford	B. Gibbons	J. Downing	Ditto	42	Fall of roof in the "heathen coal" from a slip.	–	1	–	–	–	1
„ 14	17	Old Park	Wednesbury	Lloyds, Foster, and Co.	J. Chambers	Pumper	18	Fell out of the skip whilst descending.	–	–	1	–	–	1
„ 16	18	Old Brownhills	Walsall	W. Harrison	J. Owen	Collier	65	Fell off the cage whilst ascending	–	–	1	–	–	1
„ „	19	Shut End	Kingswinford	W. O. Foster	T. Tees	Bandsman	33	Injured by coal fork on the 30th ultimo. Died this day of tetanus.	–	–	–	1	–	1
								Carried forward	1	9	8	7	1	26

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost. Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.								Brought forward -	1	9	8	7	1	26
Feb. 17	20	Union - -	West Bromwich	P. Williams and Company	J. Sharpe - -	Bandsman -	30	Fell into the pit shaft - -	–	–	1	–	–	1
„ 18	21	Freemans -	Kingswinford -	B. Gibbons - - -	E. Smith - -	Ditto -	14	Fell off the skip whilst descending -	–	–	1	–	–	1
„ 21	22	Tiled House -	Pensnett -	Skelding and Edwards -	A. Manby - -	Banksman -	22	Fell into the pit shaft with an empty skip which he pushed into the pit at the same time; injured on the 16th ult., died this day through exhaustion consequent upon amputation of his leg	–	–	1	–	–	1
„ 25	23	Nagersfield -	Brierley Hill -	Skelding and Edwards -	S. Robinson -	Bandsman -	45	Fall of coal in "thick coal" which accidentally rated off the side. He died at his own home in the course of the day on which the accident happened.	–	1	–	–	–	1
Mar. 5	24	Brereton -	Rugeley - -	Earl of Shrewsbury -	J. Harvey -	Hooker-on -	14	Laid hold of the main-hook of the band chain and was thus drawn up the shaft till he at length let go, fell, and was killed.	–	–	–	1	–	1
„ 11	25	Bromford -	West Bromwich	W. H. Dawes - -	B. Moore - -	Pikeman -	21	Fall of coal in "thick coal" caused by a sudden subsidence of the superincumbent strata.	–	1	–	–	–	1
„ „	26	Springfield -	Oldbury - -	Rowley and Company -	W. Deeley - -	Collier -	20	Walked out of the hovel with a light in his hand for two workmen that were about to descend and fell into the pit shaft.	–	–	1	–	–	1
„ 14	27	Moat - -	Tipton -	Moat Colliery Company -	E. Priest - - T. Granger -	Sinker - Ditto -	36 18	Fell part way down pit shaft; the scaffold on which they were then standing was blown up by an explosion of fire-damp, 28th pit.	2	–	–	–	–	2
„ 15	28	Ditto - -	Ditto - -	Ditto - - -	J. Griffin - -	Bandsman -	39	Suffocated by fall of dirt in Heathen coal pit.	–	1	–	–	–	1
								Carried forward -	3	12	12	8	1	36

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.								Brought forward -	3	12	12	8	1	36
Mar. 19	29	Deepfield -	Bilston - -	Earl of Dudley - -	J. Timmins -	Sinker -	28	Struck by a piece of rock which fell off the side of the shaft. The deceased should have made it secure before he descended to the bottom.	–	–	1	–	–	1
„ 22	30	Cannock Chase	Walsall - -	Cannock Chase Company	J. Guest - -	Collier -	—	Run over by a coal train - -	–	–	–	–	1	1
„ 25	31	Coppice -	Oldbury - -	R. Turner - -	W. Lewis - -	Sinker -	—	A three link hanging chain accidentally broke, and fell down the shaft upon the deceased.	–	–	–	1	–	1
„ „	32	Bilston Meadows	Bilston - -	Jones and Murcott -	W. Jones - -	Pikeman -	66	Fall of coal in "new mine" coal workings.	–	1	–	–	–	1
„ „	33	Bradley - -	Ditto -	G. B. Thorneycroft and Co.	M. Williams -	Bandsman -	20	Explosion of fire-damp on the 9th instant. Died this day.	1	–	–	–	–	1
April 2	34	Ramrod Hall -	Rowley Regis -	Earl of Dudley - -	T. Whilde -	Ditto -	19	Fall of coal from a "slip" in a pillar in thick coal pit. Died same day.	–	1	–	–	–	1
„ „	35	Wood Farm -	Walsall - -	Jevons and Mitchell -	E. Edwards -	Pikeman -	40	Explosion of fire-damp on the 24th ult. Died this day. Went into an exploring "drift" before it had been examined, contrary to the deputy's orders.	1	–	–	–	–	1
„ 4	36	Willenhall Road	Wolverhampton	J. Edge and Co. - -	J. Bird - -	Collier -	—	Fall of roof in bottom coal; injured on the 1st; died this day.	–	1	–	–	–	1
„ 8	37	Wallows -	Brierley Hill -	Earl of Dudley - -	G. Devey -	Hooker-on -	39	Injured by a piece of clod which fell from an ascending skip whilst he was wrongfully standing in the bottom, on the 2d instant; died this day.	–	–	1	–	–	1
„ 12	38	Gospel Oak -	Tipton - -	Grazebrooks and Aston -	T. Chalk - -	Bandsman -	—	Fall of coal off the side of the gate-road from between two slips in "thick coal." Rib and Pillar Pit. It was timbered and spurned.	–	1	–	–	–	1
								Carried forward -	5	16	14	9	2	46

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.								Brought forward - -	5	16	14	9	2	46
April 13	39	Willenhall -	Willenhall -	Osier Bed Company -	R. Wynne - -	Collier -	14	Fall of coal in the "new mine" -	–	1	–	–	–	1
„ 15	40	Chillington -	Wolverhampton	Chillington Company -	R. Bray - -	Pikeman -	23	Fell down pit-shaft whilst ascending. Deceased improperly stood upon the tackled skip and forced it under the framework at the pit top, which caused two of the tackling chains to break, precipitating him to the bottom; the result of his own carelessness.	–	–	1	–	–	1
„ 23	41	Bromford -	West Bromwich	W. H. Dawes - -	S. White - -	Hooker-on -	35	Crushed by cage at bottom of shaft. Injured on the 21st; died this day.	–	–	–	1	–	1
„ „	42	Cooper's Bank -	Dudley - -	S. H. Blackwell and Co.	D. Griffiths - - J. Cox - -	Deputy - Bandsman -	— —	Fall of coal from the roof in "thick coal." Rib and pillar pit (accidental).	–	2	–	–	–	2
„ „	43	Essington -	Wolverhampton	S. Mills - -	W. Anslow - -	Banksman -	22	Neglected to turn the stop block, and pushed the skip into the pit-shaft and followed it.	–	–	–	1	–	1
„ 30	44	Bentley - -	Walsall - -	Chillington Company -	W. Wilkes - -	Pikeman -	25	Fall of coal in "thin mine." Had neglected to sprag the coal whilst holing.	–	1	–	–	–	1
„ „	45	Tansey Green -	Kingswinford -	Woodall and Co. - -	J. Rhine - -	Bandsman -	40	Fall of coal in thick coa - -	–	1	–	–	–	1
May 2	46	Old Brownhills	Near Walsall -	W. Harrison - -	G. Wall - - J. Bailey - -	Collier - Ditto -	26 19	Explosion of fire-damp (*see* Report) Ditto Ditto	2	–	–	–	–	2
„ 11	47	New Parkfield -	Wolverhampton -	Parkfield Company -	M. Bryan - -	Ditto -	16	Fall of coal in "new mine coal" -	–	1	–	–	–	1
„ 12	48	Old Park -	Kingswinford -	Earl of Dudley - -	J. Matthews -	Slack carrier.	15	Fall of coal in "thick coal" - -	–	1	–	–	–	1
„ 13	49	Cradley - -	Near Stourbridge	A. Sparrow - - -	C. Giddins - -	Bandsman -	—	Fall of coal in upper workings of the "thick coal." A "rate" (loose coals) fell off the side from a slip not previously seen.	–	1	–	–	–	1
								Carried forward - -	7	24	15	11	2	59

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.								Brought forward -	7	24	15	11	2	59
May 14	50	Shepherd's Brook.	Near Stourbridge	J. Eveson and Co. - -	J. Griffin - -	Pikeman -	21	Fall of coal (in thin coal mine). About 12 cwt. weight fell off from a slip which was not seen till after the fall. Injured on the 4th, died this day.	–	1	–	–	–	1
„ 24	51	Groveland -	Tipton - -	J. Bagnall and Sons -	N. White - -	Bandsman -	25	Slipped down in the gateroad of the pit on the 10th instant, died this day.	–	–	–	1	–	1
„ 28	52	Ditto -	Ditto - -	Ditto ditto -	W. Cooper - -	Hooker-on -	20	Fell down pit shaft from the brooch coal "inset" whilst in the act of putting a skip upon the cage.	–	–	1	–	–	1
June 1	53	Barber's Field -	Bilston - -	Barber's Field Company -	R. Corfield - -	Collier -	32	Fall of coal in new mine coal -	–	1	–	–	–	1
„ 15	54	Horseley -	Tipton - -	Dixon and Co. - -	J. Roberts - -	Pikeman -	21	Fall of coal in a thick coal gate road whilst holing; deceased neglected to timber.	–	1	–	–	–	1
„ 16	55	Dimmacks -	Ditto - -	P. Williams and Sons -	D. Owen - - J. Edwards - -	Sinker - Do. -	36 40	The horse in the gin took fright and snapped that portion to which he was attached, whilst the deceased were descending, when they were immediately precipitated to the bottom of the shaft and killed.	–	–	–	2	–	2
„ „	56	Newbury Lane	Oldbury - -	Messrs. Haines and Davis	S. Deaman - -	Collier -	–	Fall of coal in "thick coal" - -	–	1	–	–	–	1
„ 22	57	Nine Locks -	Brierley Hill -	New British Iron Company	B. Westwood - S. Smith - -	Pikeman - Collier -	42 15	Fall of coal in the upper workings of the thick coal from off the side of a gate road, caused by a "bump."	–	2	–	–	–	2
„ 29	58	Newbury Lane	Oldbury - -	Messrs. Haines and Davis	D. Williams -	Pikeman -	21	Fall of coal in thick coal. Deceased was cutting a spurn out when a "bump" took place, and suddenly brought down a heavy fall of coal.	–	1	–	–	–	1
								Carried forward -	7	31	16	14	2	70

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
								Brought forward -	7	31	16	14	2	70
1864. June 30	59	Pelsall - -	Mr. Walsall -	Davis and Bloomer -	H. Garnett - -	Collier -	14	Fall of coal in a thin coal gate road, caused by a slip not previously discovered.	–	1	–	–	–	1
July 2	60	Moat - -	Pelsall - -	J. U. Fellows - -	J. Morgan - -	Pikeman -	19	Fall of coal in "thin mine." Had neglected to sprag the coal whilst holing.	–	1	–	–	–	1
„ 12	61	Eagle - -	Great Bridge -	Messrs. Cleaton - -	A. Cooper - - R. Bern - - T. Evans - - and one injured	Collier - Ditto - Ditto - —	14 13 14 –	Overwinding. A key, belonging to a crank of the valve-gear, fell out whilst the boys were ascending the pit shaft, which deprived the engine-man of all control of the engine.	–	–	3	–	–	3
„ 25	62	Bloxwich -	Bloxwich - -	Bloxwich Colliery Co. -	H. Keay - -	Pikeman -	—	Explosion of fire-damp on the 23rd. Died this day.	1	–	–	–	–	1
„ 30	„	Ditto -	Ditto -	Ditto - -	D. Morgan - -	Collier -	—	Injured by the Accident No. 62. Died this day.	1	–	–	–	–	1
Aug. 8	63	Abberley -	Abberley -	J. Moilliet - -	E. Price - -	Pikeman -	—	Fall of "roof" in thin coal mine. Deceased incautiously went under some overhanging batt which was known to be unsafe.	–	1	–	–	–	1
„ 15	64	Friary - -	Tipton - -	J. Turner - -	T. Kendal - -	Ditto -	19	Fall of coal in "thick coal" whilst engaged repairing the roof of a gate-road; injured on the 6th instant, died this day.	–	1	–	–	–	1
„ 17	65	Rough Hills -	Wolverhampton	J. Cadman and Co. -	J. Wallet - -	Sinker -	—	Fell part way down pit-shaft. Deceased was pulling some loose rock from off the side of the shaft, which knocked him out of the skip.	–	–	1	–	–	1
„ 23	66	Bradley - -	Bilston - -	G. B. Thorneycroft and Co.	J. Stokes - -	Collier -	14	Explosion of fire-damp on the 6th instant; died this day.	1	–	–	–	–	1
								Carried over - -	10	35	20	14	2	81

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
								Brought forward -	10	35	20	41	2	81
1864. Aug. 25	67	Brade's Hall -	Oldbury	J. Hackett - -	J. Dudley -	Engineman	—	Crushed by fly-wheel of the pumping engine. Injured on the 22nd instant; died this day.	–	–	–	–	1	1
„ 31	68	Bradley - -	Bilston - -	G. B. Thorneycroft and Co.	S. Haddock -	Blacksmith	—	Explosion of gunpowder in blacksmith's shop. Injured on the 29th instant; died this day.	–	–	–	–	1	1
Sept. 8	69	Herbert's Park	Darlaston -	D. Jones - - -	H. Walker -	Collier -	19	Fall of fire-clay from off the side of the gate-road in a "thin-coal" pit.	–	1	–	–	–	1
„ 11	70	Willingsworth -	Near Bilston -	J. and H. Haines -	J. Monway -	Bandsman -	32	Explosion of fire-damp. Injured on the 7th instant; died this day.	1	–	–	–	–	1
„ 14	71	Steerer's Meadow	Wednesbury -	Messrs. Davies and Allen	G. Davies -	Owner -	32	Fall of coal in "thick coal" -	–	1	–	–	–	1
„ 26	„	Willingsworth -	Near Bilston -	J. and H. Haines -	P. Mulroy -	Bandsman -	19	Explosion of fire-damp. Injured by accident No. 70, on the 7th instant; died this day.	1	–	–	–	–	1
Oct. 12	72	Newfield -	Birchills - -	Messrs. Bagnall - -	J. Jasper - -	Pikeman -	24	Fall of fire-clay roof in a thin coal pit gate road.	–	1	–	–	–	1
„ 24	73	Tame Mill -	Willenhall -	Johnson, Biggs, and Co. -	J. Finnely - -	Collier -	14	Fall of coal in "new mine coal" from the side of a pillar. The pillar was fractured, and the loose coal should have been got down.	–	1	–	–	–	1
„ 29	74	Brereton -	Rugeley - -	Earl of Shrewsbury -	T. Watkiss -	Pikeman -	38	Fall of coal in "thin coal." The deceased was driving a wedge in the cutting of a headway when he brought the coal down upon his head, which fell from an end slip.	–	1	–	–	–	1
Nov. 2	75	Russel's Hall -	Dudley -	Molland and Co. - -	S. Skidmore -	Collier -	—	Fall of coal in the "thick coal" -	–	1	–	–	–	1
„ 3	„	Ditto - -	Ditto -	Ditto - - - -	J. Kempson -	Ditto -	—	Injured by No. 75 accident; died this day.	–	1	–	–	–	1
								Carried forward -	12	42	20	14	4	92

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.								Brought forward - -	12	42	20	14	4	92
Nov. 12	76	Lunts - -	Bilston - -	Dodd and Southan - -	E. Bate - -	Horse-driver	33	Fall of roof in "new mine" coal. Deceased was bringing a loaded skip out of the work when the skip accidentally knocked one of the timber settings out in the gate road.	–	1	–	–	–	1
" 16	77	Withymoor -	Withymoor -	Messrs. Nock - -	J. Bowater and seven others.	Colliers -	—	Fell down the shaft part way; the chain broke. (*See* Report.)	–	–	8	–	–	8
" 18	78	Deepfields -	Bilston - -	Earl of Dudley - -	J. Richards - -	Collier -	14	Fall of coal in "thick-coal" -	–	1	–	–	–	1
" 21	79	Rycroft - -	Walsall - -	J. Brewer - - -	W. Price - -	Sinker -	34	Smothered in a sinking pit-shaft -	–	–	–	1	–	1
" "	80	Bank -	Darlaston - -	Yardley and Robarts -	W. Bate - -	Engineman	27	Struck by the crank of the pumping engine.	–	–	–	–	1	1
" "	81	Bloxwich -	Bloxwich - -	Bloxwich Colliery Co. -	W. Wright - -	Collier -	16	Drowned in the sump of a pit-shaft	–	–	–	1	–	1
" 26	82	Old Park -	Dudley - -	Earl of Dudley - -	A. Fellows - -	Collier -	19	Struck on the head with a timber prop, which was accidentally forced out of its place from the side of the gate way.	–	–	–	1	–	1
" 28	83	Netherton -	Dudley - -	Messrs. Grazebrook -	A. Fletcher - -	Collier -	13	Overwinding. (*See* Report.) -	–	–	–	1	–	1
" "	84	Nine Locks -	Brierley Hill -	New British Iron Company	J. Garbet - -	Pikeman -	37	Fall of coal in "thick coal" upper workings. The place was well timbered. Injured on the 21st; died this day.	–	1	–	–	–	1
Dec. 2	85	Albion - -	Willenhall -	Harper and Co. - -	S. Lister - -	Pikeman -	37	Fall of coal in "new mine coal" head-way, caused by a "slip." Injured on the 27th August; died this day.	–	1	–	–	–	1
" 5	86	Darlaston Green	Darlaston -	The Darlaston Green Iron Company.	T. Tomkinson	Bandsman -	60	Fall of coal in new mine coal. Deceased was getting coal down for the band when a portion of it accidentally fell upon him. Injured on the 3d instant; died this day.	–	1	–	–	–	1
" 10	87	Old Park -	Pensnett - -	Earl of Dudley - -	J. Matthews -	Loader -	40	Fall of coal in a thick coal gate road, where the deceased was ordered not to go by the deputy.	–	1	–	–	–	1
								Carried forward - -	12	48	28	18	5	111

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
								Brought forward -	12	48	28	18	5	111
1864. Dec. 11	88	Fox Yards -	Tipton - -	Messrs. Cresswell - -	Smith - - -	Charter-master.	30	Fell down pit shaft (deceased pushed the skip, &c. into the shaft and followed it). Provision was made at this pit with a view to prevent such an accident, which however the deceased neglected and lost his life.	–	–	1	–	–	1
" 15	89	Brereton -	Rugeley - -	Earl of Shrewsbury -	C. Brown - -	Hooker-on	30	He was wrongfully standing in the bottom of the pit shaft whilst a loaded skip was ascending. Injured on the 11th ; died this day.	–	–	–	1	–	1
" 16	90	Prior Field -	Bilston -	H. B. Whitehouse - -	J. Morris - -	Butty or charter-master	40	Whilst throwing a fall of "thick coal" he was caught by it, and killed on the spot	–	1	–	–	–	1
" "	91	Moxley - -	" -	D. Rose - - - -	C. Tranter - -	Collier -	12	Fell into the sump of the pit shaft -	–	–	–	1	–	1
" 20	92	Tame Mill -	Willenhall -	Johnson, Biggs, and Co. -	T. Brearley - -	Bandsman -	21	Fall of coal in "new mine and fire clay coals" from a "slip." A good and proper supply of timber props would have prevented this accident.	–	1	–	–	–	1
" "	93	Bradley -	Bilston - -	G. B. Thorneycroft and Co.	J. Jones - -	Pikeman -	30	Deceased was "holing" and neglected to spurn or sprag the coal. Violation of special rule 28.	–	1	–	–	–	1
" 25	94	Old Coppice -	Cannock -	Executors of E. Sayer -	E. Hick - -	Engineman	38	Went to the pumping engine in a state of intoxication, and fell into some scalding water on the 24th inst. ; died this day.	–	–	–	–	1	1
" 28	95	Goscote - -	Wallsall - -	J. C. Smith - - -	J. Starkey - -	Collier -	26	The deceased was preparing to descend the shaft for the night turn. He walked out of the hovel towards the pit, stumbled and fell headlong into it.	–	–	–	1	–	1
								Total - -	12	51	29	21	6	119

LIST of the FATAL ACCIDENTS and LOSS OF LIFE in IRONSTONE MINES in the SOUTH STAFFORDSHIRE and WORCESTERSHIRE DISTRICT, during the Year ended 31st December 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Ironstone and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864. Jan. 7	1	Cheslyn Hay, New.	Cannock	J. Hartland	J. Stackhouse	Bandsman	42	Suffocated by carbonic acid gas in a headway into which he foolishly rushed to fetch an iron crowbar, and thus lost his life.	–	–	–	1	–	1
,, 27	2	Salt Well	Netherton	Earl of Dudley	John Hurley	Ditto	39	Fall of ironstone measures on the 23d instant; died this day.	–	1	–	–	–	1
,, ,,	3	Willenhall	Willenhall	Osier Bed Company	E. Young	Ditto	40	Explosion fire-damp on the 27th instant; died this day. The deputy incautiously took a naked light into the headway to adjust the air-pipes, and accidentally fired the gas.	1	–	–	–	–	1
Feb. 23	4	Friar Park	Wednesbury	W. H. Dawes	J. Kent	Excavator	30	Fall of earth in open work	–	–	–	–	1	1
Mar. 1	5	Bromford	West Bromwich	Ditto	T. Acton	Miner	13	Explosion of fire-damp in a headway where gas had not been previously seen.	1	–	–	–	–	1
,, 19	6	Ettingshall Lodge	Bilston	Ettingshall Lodge Colliery	W. Aston	Pikeman	56	Fall of rock and ironstone measures	–	1	–	–	–	1
,, 25	7	Brades	Oldbury	Messrs. Hunt	W. Grainger	Deputy	—	Explosion of fire-damp on the 18th instant; deceased had a safety-lamp in his hand at the time, but neglected to use it, and thereby lost his life; died this day.	1	–	–	–	–	1
April 2	8	Round's Green	Ditto	R. Mason	T. Taylor	Contractor	27	Fall of ironstone measure in the Gubbin ironstone.	–	1	–	–	–	1
,, 12	9	Rough Hay	Darlaston	Messrs. Addenbrook	S. Abnet	Pikeman	28	Fall of ironstone measures, had neglected to sprагg whilst holing.	–	1	–	–	–	1
,, 29	10	Herbert's Park	Ditto	D. Jones	W. Foster	Miner	13	Accidental explosion of fire-damp in a place where gas was unknown before.	1	–	–	–	–	1
May 3	11	Willenhall	Willenhall	Osier Bed Company	T. Hodgkiss	Ditto	15	Fall of ironstone measure	–	1	–	–	–	1
June 6	12	Radnal Field	Oldbury	Captain Bennett	J. Gibbons	Pikeman	32	Explosion of fire-damp	1	–	–	–	–	1
,, 9	13	Gortsy Hill	Hales Owen	Swindell and Collis	G. Beese	Hooker-on	18	Injured by cage at the bottom of the shaft.	–	–	–	1	–	1
								Carried forward	5	5	–	2	1	13

List of Fatal Ironstone Mine Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Ironstone and Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
								Brought forward -	5	5	–	2	1	13
1864. June 11	14	Bunker's Hill -	Bilston -	Chillington Company -	T. McKeogh -	Pikeman -	—	Fall of ironstone measures -	–	1	–	–	–	1
July 22	15	Nagersfield -	Brierley Hill -	Skelding and Company -	J. Jones -	Miner -	14	Fall of roof at the way-end -	–	1	–	–	–	1
Oct. 30	16	Netherton -	Dudley -	Messrs. Grazebrook -	T. Rousell -	Ditto -	—	Slightly injured by fall of ironstone measures on the 19th instant. He, however, continued to work all that day, and also the two days following. The colliery surgeon who attended him stated that he died of fever, and want of proper nourishment; though the primary cause was the slight injury.	–	1	–	–	–	1
Nov. 5	17	Portobello -	Willenhall -	W. Ward and Sons -	J. Fletcher - John Price -	Colliery Engineers.	—	Suffocated by sulphuretted hydrogen and other gases.	–	–	–	2	–	2
" "	18	Ditto -	Ditto -	Ditto -	M. Collins -	Ditto -	—	Fell out of horse whilst ascending -	–	–	1	–	–	1
" 7	19	Bentley -	Walsall -	Chillington Company -	H. Clark -	Ironstone miner.	45	Explosion of fire-damp on the 21st ultimo; died this day.	1	–	–	–	–	1
" 22	20	New Cross -	Wednesfield -	H. B. Whitehouse -	G. Leatham -	Ditto -	—	Fall of roof in ironstone measures on the 18th instant; died this day.	–	1	–	–	–	1
" 23	21	Bowman's Harbour.	Ditto -	Ditto -	C. Guy -	Ditto -	16	Fall of roof in a headway -	–	1	–	–	–	1
Dec. 9	22	Gospel Oak -	Tipton -	Grazebrook and Company	J. Humphries -	Contractor -	31	Fall of roof; brought about by his own neglect to put up timber props.	–	1	–	–	–	1
" 10	23	Ward -	Bloxwich -	Ward Colliery Company -	P. Dolan -	Labourer -	25	Fall of calcined ironstone upon the surface of the colliery.	–	–	–	–	1	1
" 15	24	Moxley -	Bilston -	S. Groucutt and Sons -	S. Skeldon -	Hooker-on -	30	Struck by a piece of clod which fell from an ascending skip. Deceased was improperly standing in the bottom of the pit shaft.	–	–	–	1	–	1
								Total -	6	11	1	5	2	25

Mr. Wales' Report.

Report on the Working of the Mines Inspection Act (23 & 24 Vict. c. 151.) for the South Wales District, for the Year ended 31st December 1864.—By Thomas E. Wales, Esq.

Sir, Swansea, 28th February 1865.

As inspector of coal mines for the South Wales District I have the honour to transmit my report (with accompanying list of fatal accidents and deaths arising therefrom) for the year ended December 31st, 1864.

The number of fatal accidents amounted to 101, against 99 in 1863, being an increase of 2; and the number of deaths arising therefrom 105, as against 159 in 1863, being a decrease of 54,—a most satisfactory result.

The way in which these 105 deaths have taken place will be seen by the following monthly statement:—

	Underground.					On surface.		Total.
	Explosions.	Falls of Coal.	Falls of Stone.	In Shafts.	Miscellaneous.	Machinery.	Miscellaneous.	
January - - - - -	—	1	4	2	2	—	—	9
February - - - - -	—	1	2	—	—	—	3	6
March - - - - -	1	—	7	—	1	—	1	10
April - - - - -	1	1	3	—	1	—	—	6
May - - - - -	—	2	5	—	1	—	—	8
June - - - - -	—	—	8	—	2	—	—	10
July - - - - -	—	1	6	—	2	—	—	9
August - - - - -	3	2	6	2	—	1	1	15
September - - - - -	1	1	3	—	3	—	—	8
October - - - - -	—	2	1	—	2	—	—	5
November - - - - -	—	1	3	—	3	—	—	7
December - - - - -	—	1	6	2	1	1	1	12
	6	13	54	6	18	2	6	105

The annexed tabular form will show the per-centage of fatal accidents, and persons killed, and quantity of coal raised per each fatal accident and life lost:—

Number of persons employed, as per census tables 1861 (excluding 3,000 in Mr. Brough's district) - - - - - -	26,292
Computed number of persons employed in 1864 - -	29,076
Computed quantity of coal raised - - - - - -	6,948,000
Separate fatal accidents - - - - -	101
Lives lost by the accidents - - - - - -	105
Persons employed per separate fatal accident - -	288
Persons employed per life lost by the accidents - - -	277
Tons of coal raised per separate fatal accident - -	68,792
Tons of coal raised per life lost by the accidents - - -	66,171

Four explosions have occurred during the year, causing the death of six persons, two of which occurred after my appointment; into both of which I made a careful examination.

The first (No. 62 on the list) occurred on the 10th of August, in the workings of the "Nine Feet Vein," No. 9 pit, the property of the Aberdare Iron Company, Glamorganshire, resulting in the death of three persons.

This vein is worked partly by safety-lamps and partly by naked lights. The total quantity of air circulating I ascertained to be upwards of 90,000 cubic feet per minute, which was split or divided into several subdivisions, one of which, about 16,000 cubic feet per minute, ventilated the district where the explosion occurred. This quantity would, in my opinion, have been sufficient under ordinary circumstances, but a fresh communication had been made, forming a much nearer route for the air to travel, and through which, if not prevented by a door or other means, it would naturally pass, leaving certain stalls partly if not wholly unventilated. A door had been erected, but I believe not sufficiently closed to direct a sufficient current into the stalls referred to, in one of which gas had accumulated, and was ignited by a candle of one of the deceased.

In order to describe this occurrence more minutely, I beg to refer you to the annexed plan of the workings. Previous to the communication (G) being made between the stalls A and B, the air travelled from B to H, and round by C and E to F, and it was intended, after this communication was made, that the stall F should continue to be ventilated in the same manner.

To cause the air to continue to go the same way after holing, it was necessary to have a door erected in the stall A, as was done about the position marked D x on the plan; this door, however, not being sufficiently close at the time of breaking through from A to B, the air took the nearest road, leaving the stall F unventilated, and hence the explosion.

The other fatal explosion, No. 72 on the list resulting in the loss of one life, occurred on the 7th of September, in the workings of the No. 2 vein, Cymmer Level Colliery, Rhondda Valley, belonging to Mr. T. C. Hinde.

The district (marked A on the annexed plan) in which this explosion occurred, was being rapidly extended through a large fault, and the quantity of air with which it was ventilated was very small, not more than 2,000 cubic feet per minute, which was borne round the whole of the working places in one continuous current, thus necessitating the use of several doors, none of which were doubled, so that in addition to the small quantity of air pervading the workings, it was, by such an arrangement, liable to be cut off by the neglect or injury of any one of these doors. It was further proved that no examination of the workings had been made previous to the workmen proceeding to their working places, in one of which gas had accumulated, and on the deceased entering it the gas ignited at his candle. The defective arrangements referred to were duly communicated to the owner, and a proper person was appointed to examine the places in future. Had this been done before, the gas would have been detected, and the explosion prevented. At the inquest the jury censured the person in charge for allowing such defective arrangements to exist. This is by no means a fiery vein, and except where the ordinary measures for safety are neglected, as in this case, such an accident ought rarely, if ever, to occur.

The coals worked in the Aberdare district are heavily charged with gas, and are chiefly worked with locked safety-lamps; but I regret to have to report that with one or two exceptions the firing of shots is still allowed, and attended with great danger.

In all fiery veins worked with locked safety-lamps, the use of gunpowder ought to be strictly prohibited, and more especially in collieries worked upon the South Wales principle, where the old works or "goaves" are always within a comparatively short distance of the stalls, and which may contain large quantities of gas liable to be forced out by many contingencies upon the very places where the firing of shots is going on. So recently as the 17th instant, an explosion occurred through the firing of a shot in the Bute Merthyr Colliery, causing the loss of four lives.

The number of deaths from falls of coal and stone amounted to 67. I carefully examined into the causes of several of these, and in no single instance did I ascertain that there had been an inadequate supply of suitable props or timber.

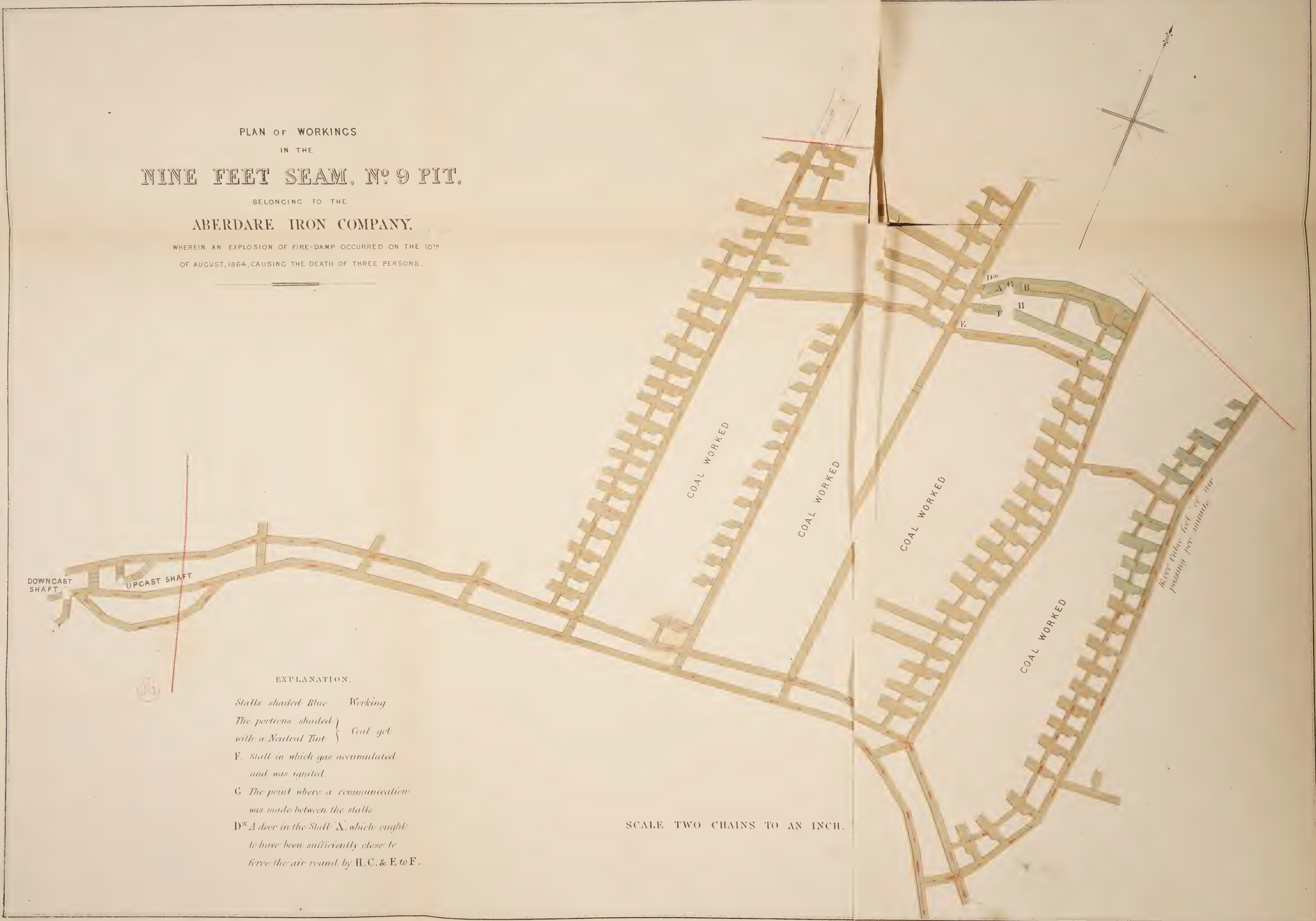
Throughout the whole of this district it is the duty of the workmen to set or fix their own timber, so that the prevention of such accidents in a great measure depends upon the care and judgment exercised by themselves; but it is often difficult to determine when the roof is dangerous, the usual tests often proving fallacious.

In many parts of the district certain veins lie within a short distance of each other, so that the working of one frequently disturbs the working of the other, and renders them much more liable to falls than they would be under different conditions.

The number of lives lost in shafts amounted to six; five of which occurred after my appointment, the causes of which were carefully investigated. Two were caused by falling whilst at work in the shafts, and three by the recklessness of the sufferers themselves, in getting on to the carriages at places forbidden by the rules.

In one case, at the Gadlys Colliery, the two deceased and two others got on to the carriage at a landing which had been disused for some time. A proper signal was put up, but they past it, and as soon as they got on to the carriage, and were being brought

PLAN OF WORKINGS
IN THE
NINE FEET SEAM, Nº 9 PIT,
BELONGING TO THE
ABERDARE IRON COMPANY,
WHEREIN AN EXPLOSION OF FIRE-DAMP OCCURRED ON THE 10TH
OF AUGUST, 1864, CAUSING THE DEATH OF THREE PERSONS.


DOWNCAST SHAFT
UPCAST SHAFT
COAL WORKED
COAL WORKED
COAL WORKED
COAL WORKED
Dr.
A
G
B
F
H
E
C
6,000 Cubic feet of air passing per minute

EXPLANATION.

Stalls shaded Blue.	*Working*
The portions shaded with a Neutral Tint	*Coal got*

F. *Stall in which gas accumulated and was ignited.*

G *The point where a communication was made between the stalls*

Dr. *A door in the Stall "A", which ought to have been sufficiently close to force the air round by* H. C. & E *to* F.

SCALE TWO CHAINS TO AN INCH.

Day & Son, Limited Lith.

a
f
s

In one case, at the Gadlys Colliery, the two deceased and two others got on to the carriage at a landing which had been disused for some time. A proper signal was put up, but they past it, and as soon as they got on to the carriage, and were being brought up, one of the survivors said it struck against the sides of the shaft, and continued to strike till the carriage tilted and three of them fell, he clinging to it till the engineer stopped it.

I believe after the men had got on the carriage, it had not been allowed to stand long enough to steady, and so struck the sides of the shaft, as described by one of the survivors. This pit was fitted up with chain guides which are ill adapted for winding, and especially at a high speed, as was the case in this instance; where the coal is raised by an engine working at a great velocity the guides ought to be of the best and most substantial kind, and great care ought always to be taken in raising and lowering persons.

The number of miscellaneous accidents amounted to 18, one of which was caused by an explosion of gunpowder, the others by falling before trams, tubs, &c.; and eight lives were lost by sundry causes on the surface.

The number of fatal accidents in the Ironstone Mines was seven, causing the loss of seven lives, all from falls of stone.

The computed number of iron miners is 3,900, and quantity of ironstone raised 450,000 tons, which gives one fatal accident, and one life lost to every 557 persons employed annually; and 64,285 tons of ironstone raised to each fatal accident and life lost. It will be observed that the per-centage of deaths in coal mines far exceeds the per-centage in ironstone mines, although in my opinion the supervision is much more efficient in the former than the latter.

I have carefully inquired into the working of the Act in reference to the education of boys employed in coal and ironstone mines under 12 years of age, and find, with some few exceptions (when they are employed on producing certificates from properly qualified schoolmasters as to their attendance at school, &c.), they are prohibited from entering the mines until they have reached the age of 12.

In only one instance have I heard a colliery manager complain of the working of this part of the Act. He said parents would and did send their children to other work, from which they were not prohibited, rather than keep them at home so long unemployed; where they would continue, and ultimately cause a scarcity of colliers, now in great demand. This I have no doubt is so where collieries are near either copper or iron works, &c. There is a much stronger disposition manifested by the workmen themselves to have their boys employed under the stipulated age than by either managers or owners. The men often complain that they cannot afford to keep their boys so long unemployed.

In all large works or collieries good schools are established, and at collieries not sufficiently extensive to support schools, the children are sent to other schools, national and British, to which many of the owners subscribe, and which are generally within a reasonable distance. In all except the most isolated cases schools of one form or other are provided.

In the case of schools in connection with the works, the terms are from one halfpenny to twopence per week, depending chiefly upon the age. At schools not connected with the works the terms range from one penny to fourpence per week, also depending on the age.

In conclusion, I beg to state that in my opinion the results of the past year tend to prove that the Coal Mines Inspection is working satisfactorily.

I have, &c.
THOS. E. WALES.

To the Right Hon. Sir George Grey, Bart., G.C.B.,
Secretary of State, London.

List of the Fatal Colliery Accidents, and Loss of Life arising therefrom, in the South Wales District, during the Year ended 31st of December 1864.

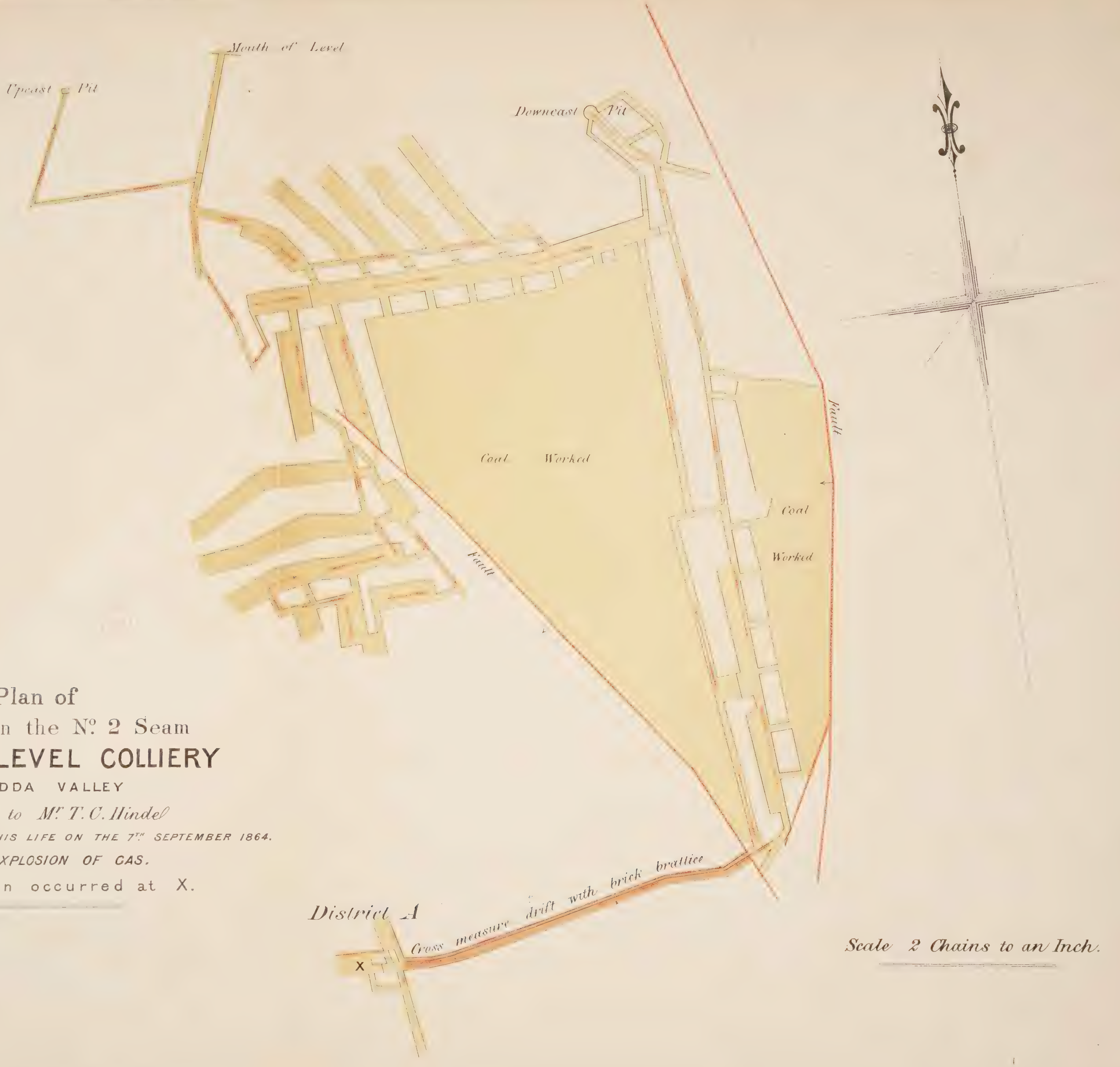
Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Underground.						On surface.		
									Explosions.	Falls of Coal.	Falls of Stone.	Suffocation.	In Shafts.	Miscellaneous.	Machinery.	Miscellaneous.	Boilers bursting.
1864. Jan. 2	1	Gadlys	Aberdare	Gadlys Iron Company	Benj. Treherne	Collier	20	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 11	2	Ditto	Ditto	Gadlys Iron Company	Cor. Miller	Ditto	25	Crushed by trams	–	–	–	–	–	1	–	–	–
,, 14	3	Pentyrch	Cardiff	Booker and Co.	Edw. Evans	Haulier	17	Fall of coal	–	1	–	–	–	–	–	–	–
,, 16	4	Dare	Aberdare	Rhys and Co.	Isaac Nicholas	Collier	24	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 17	5	Cwmdare	Ditto	Powell's Steam Coal Company Limited.	Henry Davies	Ditto	30	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 17	6	Cwmnoel	Ditto	Merthyr United Collieries Company Limited.	David Rees	—	—	Fell down shaft	–	–	–	–	1	–	–	–	–
,, 21	7	Llanharry	Llantrissant	G. A. Brain	Geo. Dobbs	Collier	21	Fall of scaffold in shaft	–	–	–	–	1	–	–	–	–
,, 27	8	Bryngwm	Llanelly	Bryngwm Company	Herbert Rees	Ditto	63	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, ,,	9	Hirwain	Hirwain	Hirwain Steam Company	Howell Williams	Roadman	52	Crushed by trams	–	–	–	–	–	1	–	–	–
								Total number of deaths in January	–	1	4	–	2	2	–	–	–
Feb. 10	10	Dowlais	Dowlais	Guest and Co.	Philip Griffiths	Collier	39	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 10	11	Coedcae	Merthyr	W. Crawshay	Timothy Williams	Ditto	53	Fall of coal	–	1	–	–	–	–	–	–	–
,, 11	12	Llynwhyn	Pontypridd	Glamorgan Coal Company Limited.	John Thomas	Carpenter	22	Fall of timber on surface	–	–	–	–	–	–	–	1	–
,, 11	13	Techion	Llanelly	Thomas Harris	David Williams	Trammer	17	Trams fell on him (surface)	–	–	–	–	–	–	–	1	–
,, 17	14	Tondu	Bridgend	Brogden and Sons	Rees Lewis	Tipper	18	Trams fell on him (surface)	–	–	–	–	–	–	–	1	–
,, 18	15	Dowlais	Dowlais	Guest and Co.	David Jones	Collier	27	Fall of stone from roof	–	–	1	–	–	–	–	–	–
								Total number of deaths in February	–	1	2	–	–	–	–	3	–
Mar. 1	16	Morfa	Taibach	Vivian and Sons	David Jenkins	Haulier	17	Run over by trams (surface)	–	–	–	–	–	–	–	1	–
,, 1	17	Neath	Neath	Pellenor and Co.	Thew Parker	Collier	58	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 7	18	Dowlais	Dowlais	Guest and Co.	John Thomas	Ditto	13	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 10	19	Bryn George	Llanelly	Simms, Willyams, and Co.	Wm. Richard	Ditto	45	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 15	20	Blaengwawr	Aberdare	David Davies	David Lloyd	Haulier	17	Fell under trams	–	–	–	–	–	1	–	–	–
,, ,,	21	Tonmawr	Cardiff	W. S. Cartwright	David Stephen	Collier	14	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, ,,	22	Gadlys	Aberdare	Gadlys Iron Company	David Davies	Mason	20	Explosion of gas	1	–	–	–	–	–	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Underground.						On surface.		
									Explosions.	Falls of Coal.	Falls of Stone.	Suffocation.	In Shafts.	Miscellaneous.	Machinery.	Miscellaneous.	Boilers bursting.
1864. Mar. 19	23	Pentyrch	Cardiff	Booker and Co.	George Combie	Collier	40	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 16	24	Penaltta	Gellygaer	Powell and Sons	Morgan Morgan	Ditto	13	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 23	25	Ferndale	Swansea	Ferndale Company	Thomas Williams	Ditto	28	Fall of stone from roof	–	–	1	–	–	–	–	–	–
								Total number of deaths in March	1	–	7	–	–	1	–	1	–
April 1	26	Werfa	Aberdare	Heath, Evans, and Co.	Benjamin Evans	Ditto	13	Fall of coal	–	1	–	–	–	–	–	–	–
„ 9	27	Morfa	Taibach	Vivian and Sons	Lewis Roberts	Haulier	16	Crushed by trams	–	–	–	–	–	1	–	–	–
„ 13	28	Squborwen	Aberdare	Samuel Thomas	William Morris	Collier	30	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 15	29	Cymmer Level	Pontypridd	T. C. Hinde	Richard Evans	Ditto	25	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 18	30	Llynvi Valley	Bridgend	Llynvi Vale Iron Company	John Minton	Ditto	16	Explosion of gas	1	–	–	–	–	–	–	–	–
„ 21	31	Bryn George	Llanelly	Simms, Willyams, and Co.	David Hopkins	Ditto	53	Fall of stone from roof	–	–	1	–	–	–	–	–	–
								Total number of deaths in April	1	1	3	–	–	1	–	–	–
May 2	32	Bryndu	Pyle	Ford and Co.	Thomas Lewis	Ditto	16	Fall of coal	–	1	–	–	–	–	–	–	–
„ 12	33	Gadlys	Aberdare	Gadlys Iron Company	William Morgan	Ditto	13	Crushed by trams	–	–	–	–	–	1	–	–	–
„ 14	34	Llangannech	Pontypridd	T. S. Margrave	John Doyle	Ditto	15	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 23	35	Blaengwawr	Aberdare	David Davies	David Miles	Ditto	10½	Fall of coal	–	1	–	–	–	–	–	–	–
„ 24	36	Cyfarthfa	Merthyr	W. Crawshay	Evan Griffiths	Ditto	13	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 28	37	Neath Abbey	Neath	Neath Abbey Co.	Evan Owen	Ditto	22	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 29	38	Cyfellon	Pontypridd	Robert Reece	John Morgan	Ditto	53	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 30	39	Bedw	Ditto	Richard Ellis	Philip Jones	Ditto	27	Fall of stone from roof	–	–	1	–	–	–	–	–	–
								Total number of deaths in May	–	2	5	–	–	1	–	–	–
June 1	40	Bettws	Bridgend	Bettws Company	William Crook	Ditto	49	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 4	41	Old Castle	Llanelly	Simms, Willyams, and Co.	William Hugh	Ditto	27	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 15	42	Cwmavon	Taibach	Company of Copper Miners	Henry Jones	Ditto	32	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 18	43	Wern-ddu	Swansea	A. Lonshiff	George Jones	Ditto	18	Crushed by trams	–	–	–	–	–	1	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Under ground.						On surface.		
									Explosions.	Falls of Coal.	Falls of Stone.	Suffocation.	In Shafts.	Miscellaneous.	Machinery.	Miscellaneous.	Boilers bursting.
1864. June 19	44	Browllfa	Aberdare	Kirkhouse and Co.	William Rees	Collier	22	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ „	45	Pentyrch	Cardiff	Booker and Co.	John Morgan	Haulier	13	Run over by trams	–	–	–	–	–	1	–	–	–
„ 21	46	Dare	Aberdare	Rhys and Co.	John Walters	Door-boy	13	Fall of stone from sides	–	–	1	–	–	–	–	–	–
„ 23	47	Deep Duffryn	Ditto	Nixon, and Co.	Richard Morgan	Collier	49	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 25	48	St. George's	Llanelly	Simms, Willyams, and Co.	Richard Jones	Ditto	22	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ „	49	Ystalyfera	Swansea	Ystalyfera Iron Company	John Hopkins	Door-boy	13½	Fall of stone from roof	–	–	1	–	–	–	–	–	–
								Total number of deaths in June	–	–	8	–	–	2	–	–	–
July 9	50	Cwmamman	Aberdare	Shepherd and Evans	Richards Measey	Pitman looking after pumps.	50	Fell into sump	–	–	–	–	–	1	–	–	–
„ 11	51	Llynn Vale	Bridgend	Llynvi Vale Iron Company	Samuel Stephen	Haulier	32	Run over by trams	–	–	–	–	–	1	–	–	–
„ 21	52	Neath Abbey	Neath	Neath Abbey Company	John Evans	Collier	36	Fall of coal	–	1	–	–	–	–	–	–	–
„ „	53	Llynvi Vale	Bridgend	Llynvi Vale Iron Company	David Davies	Ditto	27	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 22	54	Dowlais	Dowlais	Guest and Co.	John Jones	Ditto	17	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 23	55	Ditto	Ditto	Ditto	Lewis Thomas	Roadman	42	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 27	56	Llethyshenkin	Aberdare	Rees and Co.	W. Mattock	Collier	23	Fall of stone from roof } brothers	–	–	1	–	–	–	–	–	–
					Thomas Mattock	Ditto	14	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 30	57	Dowlais	Dowlas	Guest and Co.	John Clarke	Ditto	13	Fall of stone from roof	–	–	1	–	–	–	–	–	–
								Total number of deaths in July	–	1	6	–	–	2	–	–	–
Aug. 1	58	Abernant	Aberdare	Fothergill and Co.	Thomas Price	Mason	50	Fell into sump	–	–	–	–	1	–	–	–	–
„ 3	59	Broadoaks	Lloughor	Broadoaks Company Limited	John Rees	Ditto	22	Fall of a building, stone surface	–	–	–	–	–	–	–	1	–
„ 6	60	Llynvi Vale	Bridgend	Llynvi Vale Iron Company	David Thomas	Collier	22	Fall of coal	–	1	–	–	–	–	–	–	–
„ 8	61	Earlswood	Briton Ferry	George Tissington	George Sargent	Ditto	26	Fall of stone from roof	–	–	1	–	–	–	–	–	–
„ 10	62	Abernant	Aberdare	Fothergill and Co.	Thomas Adams	Ditto	34	Explosion of gas	3	–	–	–	–	–	–	–	–
					W. Thomas	Ditto	32										
					Thomas Osborne	Ditto	17										
„ 15	63	Bishwell	Swansea	Pandy and Co.	Morgan Thomas	Labourer	12	Crushed by T-bob	–	–	–	–	–	–	1	–	–
„ 17	64	Abernant	Aberdare	Fothergill and Co.	Thomas Williams	Collier	17	Fall of stone from roof	–	–	1	–	–	–	–	–	–


Mouth of Level
Upcast Pit
Downcast Pit
Coal Worked
Fault
Fault
Coal Worked
District A
Cross measure drift with brick brattice
X

Plan of
Workings in the No. 2 Seam
CYMMER LEVEL COLLIERY
RHONDDA VALLEY

Belonging to Mr. T. C. Hinde

WHERE A COLLIER LOST HIS LIFE ON THE 7TH SEPTEMBER 1864.

BY AN EXPLOSION OF GAS.

The Explosion occurred at X.

Scale 2 Chains to an Inch.

Day & Son, Limited, Lith.

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Underground.						On Surface.		
									Explosions.	Falls of Coal.	Falls of Stone.	Suffocation.	In Shafts.	Miscellaneous.	Machinery.	Miscellaneous.	Boilers bursting.
1864. Aug. 18	65	Plymouth -	Merthyr - -	Fothergill and Company -	Thomas Jones -	Collier -	14	Fall of stone from roof - - -	–	–	1	–	–	–	–	–	–
" "	66	Cross Hands -	Llanelly - -	Norton and Company -	John Jones -	Ditto -	19	Fall of coal - - - - -	–	1	–	–	–	–	–	–	–
" 23	67	Dare - -	Aberdare - -	Rhys and Company -	William Thomas	Ditto -	13	Fall of stone from roof - - -	–	–	1	–	–	–	–	–	–
" 24	68	Llantwit -	Gellygaer - -	Powell and Sons - -	John Thomas -	Ditto -	30	Ditto - - - - -	–	–	1	–	–	–	–	–	–
" "	69	Llynvi Vale -	Bridgend - -	Llynvi Vale Iron Company	Joseph Jones -	Blacksmith	30	Fell down shaft - - - -	–	–	–	–	1	–	–	–	–
" 29	70	Techion - -	Llanelly - -	Thomas Harris - -	William Evans -	Collier -	24	Fall of stone from side - - -	–	–	1	–	–	–	–	–	–
								Total number of deaths in August	3	2	6	–	2	–	1	1	–
Sept. 7	71	Abeerprgwym -	Neath - -	William Williams - -	William Howells	Ditto -	13	Fall of stone from side - - -	–	–	1	–	–	–	–	–	–
" "	72	Cymmer Level	Pontypridd -	T. C. Hinde - - -	Thomas Allen -	Ditto -	21	Explosion of gas - - - -	1	–	–	–	–	–	–	–	–
" 10	73	Morfa - -	Taibach - -	Vivian and Sons - -	Daniel George -	Haulier -	24	Crushed by trams - - -	–	–	–	–	–	1	–	–	–
" 15	74	Cwmavon -	Ditto -	Company of Copper Miners	Thomas Lewis -	Ditto -	16	Ditto - - - - - -	–	–	–	–	–	1	–	–	–
" 16	75	Dare - -	Aberdare - -	Rhys and Company - -	Thomas Davies -	Collier -	26	Fall of stone from roof - - -	–	–	1	–	–	–	–	–	–
" 19	76	Gadlys - -	Ditto -	Gadlys Iron Company -	W. Jenkins -	Ditto -	68	Crushed by trams - - - -	–	–	–	–	–	1	–	–	–
" "	77	Abercwmboy -	Ditto -	David Davies - - - -	Richard Richards	Ditto -	49	Fall of coal - - - - -	–	1	–	–	–	–	–	–	–
" "	78	Bryndu - -	Pyle - -	Ford and Company - -	Jenkin Thomas -	Ditto -	40	Fall of stone from roof - - -	–	–	1	–	–	–	–	–	–
								Total number of deaths in September	1	1	3	–	–	3	–	–	–
Oct. 6	79	Aberamman -	Aberdare - -	Trustees of the late D. Williams.	John Rollands -	Ditto -	46	Fall of coal - - - - -	–	1	–	–	–	–	–	–	–
" 7	80	Plymouth -	Merthyr - -	Fothergill and Company -	Philip Samuel -	Ditto -	12	Ditto - - - - - -	–	1	–	–	–	–	–	–	–
" 15	81	Glynfach -	Pontypridd -	Greenhill and Company -	Thomas Morgan	Ditto -	46	Fall of stone from roof - - -	–	–	1	–	–	–	–	–	–
" "	82	Logan - -	Swansea - -	Trevor Williams - -	Isaac Hopkins -	Ditto -	15	Run over by trams - - -	–	–	–	–	–	1	–	–	–
" 18	83	Werfa - -	Aberdare - -	Heath, Evans, and Company.	Charles Prothroe	Ditto -	$9\frac{3}{4}$	Drowned in sump. The manager, Mr. W. Williams, was proceeded against for employing deceased under 10 years of age, and fined 5*l.* and costs.	–	–	–	–	–	1	–	–	–
								Total number of deaths in October	–	2	1	–	–	2	–	–	–

List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death and Remarks.	Underground.						On Surface.		
									Explosions.	Falls of Coal.	Falls of Stone.	Suffocation.	In Shafts.	Miscellaneous.	Machinery.	Miscellaneous.	Boilers bursting.
1864. Nov. 5	84	Werfa	Aberdare	Heath, Evans, and Co.	John Jones	Collier	37	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 10	85	Abernant	Aberdare	Fothergill and Co.	William John	Collier	28	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 11	86	Great Western	Pontypridd	Great Western Railway Co.	Samuel Forge	Collier	15	Fall of coal	–	1	–	–	–	–	–	–	–
,, 12	87	Lower Duffryn	Aberdare	Powell's Steam Coal Company Limited.	Thomas Watkins	Haulier	37	Crushed by carriage whilst crossing bottom of shaft.	–	–	–	–	–	1	–	–	–
,, 16	88	Abergwawr	Aberdare	David Davies	Thomas Jones	Collier	27	Explosion of gunpowder	–	–	–	–	–	1	–	–	–
,, 17	89	Bwllfa	Pontypridd	Fothergill and Co.	Isaac England	Collier	15	Deceased, with several others, was riding on the full trams on the surface incline, against the rules of the colliery; fell, and the trams passed over his hand. It was not considered a serious accident, but in a few days lock-jaw ensued, from which he died.	–	–	–	–	–	1	–	–	–
,, 18	90	Navigation	Aberdare	Nixon and Co.	Joseph Davies	Collier	63	Fall of stone from roof	–	–	1	–	–	–	–	–	–
								Total number of deaths in November	–	1	3	–	–	3	–	–	–
Dec. 1	91	Graig	Neath	Rhys and Co.	Joseph Rollands	Collier	28	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, ,,	92	Penydarrin	Merthyr	Guest and Co.	Daniel John	Collier	20	Fall of coal	–	1	–	–	–	–	–	–	–
,, ,,	93	Penycraig	Ely Valley	Penycraig Coal Company	David Thomas	Collier	20	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 2	94	Navigation	Aberdare	Nixon and Co.	John Jones	Collier	37	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 6	95	Pentre	Ely Valley	Simon Davis	Joseph Halled	Collier	14	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 7	96	Navigation	Aberdare	Nixon and Co.	Joseph Rees	Haulier	21	Kicked by a horse	–	–	–	–	–	1	–	–	–
,, 22	97	Cwmavon	Taibach	English Company of Copper Miners.	Joseph Llewellyn	Labourer	60	Fell from screen	–	–	–	–	–	–	–	1	–
								Knocked down by locomotive	–	–	–	–	–	–	1	–	–
,, 23	98	Neath Abbey	Neath	Neath Abbey Company	David Rees	Carpenter	34	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, 26	99	Old Castle	Llanelly	Simms, Willyams, and Co.	Thomas Norris W. Morgan	Collier Collier	58 26	Fell down shaft whilst ascending	–	–	–	–	2	–	–	–	–
,, 29	100	Gadlys	Aberdare	Gadlys Iron Company	Thomas Jones	Collier	17	Fall of stone from roof	–	–	1	–	–	–	–	–	–
,, ,,	101	Dowlais	Dowlais	Guest and Co.	Richard Rees	Collier	13										
								Total number of deaths in December	–	1	6	–	2	1	1	1	–

LIST of the FATAL IRONSTONE MINE ACCIDENTS, and LOSS of LIFE arising therefrom, in the SOUTH WALES DISTRICT, during the Year ended 31st December 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Underground.						On surface.		
									Explosions.	Falls of Coal.	Falls of Stone.	Suffocation.	In Shafts.	Miscellaneous.	Machinery.	Miscellaneous.	Boilers bursting.
1864.																	
Jan. 2	—	Gadlys	Aberdare	Gadlys Iron Company	Benjn. Traherne	Miner	20	Fall of stone	—	—	1	—	—	—	—	—	—
Feb. 10	—	Dowlais	Dowlais	Guest and Co.	Philip Griffiths	Ditto	39	Fall of stone	—	—	1	—	—	—	—	—	—
April 11	—	Cyfarthfa	Merthyr	Wm. Crawshay	Dd. Thomas	Ditto	25	Fall of stone	—	—	1	—	—	—	—	—	—
May 2	—	Gadlys	Aberdare	Gadlys Iron Company	Thos. Jones	Ditto	26	Fall of stone	—	—	1	—	—	—	—	—	—
July 23	—	Abernant	Aberdare	Aberdare Iron Company	Benjn. Thomas	Ditto	29	Fall of stone	—	—	1	—	—	—	—	—	—
Aug. 2	—	Plymouth	Merthyr	Plymouth Iron Company	Thos. Walters	Ditto	23	Fall of stone	—	—	1	—	—	—	—	—	—
Sept. 20	—	Cwmavon	Cwmavon	Governor and Company of Copper Miners.	John Morgan	Ditto	27	Fall of stone	—	—	1	—	—	—	—	—	—
								Total	—	—	7	—	—	—	—	—	—

LIST OF NON-FATAL ACCIDENTS—IRONSTONE MINES.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Explosions.	Falls of Coal.	Falls of Stone.	Suffocation.	In Shafts.	Miscellaneous.	Machinery.	Miscellaneous.	Boilers bursting.
Feb. 12	—	Plymouth	Merthyr	Plymouth Iron Company	Wm. Howells Thos. Evans	Miner Ditto	—	Blasting Powder	—	—	—	—	—	—	2	—	—
Mar. 2	—	Plymouth	Merthyr	Plymouth Iron Company	Rhys Thomas Dd. K. Thomas Thos. Philips	Ditto Ditto Ditto	—	Explosion of gas	3	—	—	—	—	—	—	—	—
								Total	3	—	—	—	—	—	2	—	—

Mr. Moore's Report.

REPORT of the INSPECTOR of MINES and COLLIERIES in the EASTERN DISTRICT OF SCOTLAND, for the Year ended 31st December 1864.—By RALPH MOORE, Esq.

SIR, Cambuslang, 28th February 1865.

I HAVE the honour to submit my report for the year ending 31st December 1864.

The past year has been one of great activity in the coal trade; better prices have been realized, and the colliers have had abundance of employment at good wages. As happens in all such times, the workmen have to some extent been unsettled, more especially in Fife and Mid and East Lothian; but there has been no strike of any magnitude. Additional collieries have been opened up, principally in the Motherwell and Hamilton districts of the county of Lanark, which has increased the quantity of coal raised, so that the amount raised in this district of inspection for the last year is larger than in any former year. It is satisfactory to find from the tables which follow, that the increase has been obtained with fewer accidents of a fatal nature and less loss of life, upon the whole, than in either of the two preceding years; a result owing, doubtless, to increased vigilance on the part of the owners and managers of collieries, and to the adoption, especially in the newer collieries, of improved arrangements.

During the last year the loss of life in coal mines was - -	34
Ditto in ironstone mines under the statute - - -	5
Total loss of life - - -	39

The total loss of life in coal and ironstone mines for the last three years has been—

Year.	Explosions.	Falls.	Shafts.	Miscellaneous.	Total.
1862 -	5	35	12	1	53
1863 -	3	29	12	4	48
1864 -	1	25	8	5	39

In accordance with your instructions, I have endeavoured to obtain information as to boys employed underground in coal mines between ten and twelve years of age; and also as to the quantity of coals raised during the past year, and the number of persons employed. For this purpose, schedules were issued to the owners of the various collieries to fill in the required information. Most of them complied, and in the few cases of non-compliance I have made careful estimates; so that the following tables may be held to approximate to the real numbers:—

The computed quantity of coal raised in 1864 is - -	6,400,000 tons.
Number of persons employed in and about the collieries -	21,150
Lives lost by fatal accidents - - - -	34
Persons employed per life lost by accident - - -	641
Tons of coal raised per life lost by accident - -	188,235

Coal working in this district is confined to four principal localities, in which the thickness of the seams of coal, and the mode of working, vary. These are:—

(1.) Lanarkshire.—The principal output is from seams of coal from five to seven and eight feet thick, which are worked chiefly by the "stoop and room" method:

(2.) Linlithgowshire and Stirlingshire.—The principal output is from seams of coal from two to three feet thick, except in the case of the famous Torbanehill coal, which is worked profitably when as low as five and six inches thick. The workings are wholly by the longwall method:

(3.) Edinburgh and Haddington shires.—The output is from seams of coal of the average of four feet, in some cases (the "great seam") 9 and 10 feet. Workings, except the great seam, generally by the longwall method.

(4.) Fife, Kinross, Clackmannan, and Perth shires.—The principal output is from seams about four feet in thickness, and worked by the longwall method. The Lochgelly Splint coal, working eight feet and upwards, and the Dysart coal, 16 feet, are both worked by stoop and room.

Although in point of safety there may not be so much difference between one locality and another, yet it is evident, where horses are freely used instead of men to draw the coal from the workings to the pit bottom, and in seams of six and eight feet, there will be fewer persons employed to raise a thousand tons of coal than where horses are not employed, or in thinner seams; and taking the localities separately, we get the following results :—

1864.	No. 1. Lanark, &c.	No. 2. Stirling, &c.	No. 3. Edinburgh, &c.	No. 4. Fife, &c.
Quantity raised - - - - Tons	3,540,000	933,000	619,000	1,308,000
Number of persons employed - - - - -	10,000	3,710	2,500	4,900
Quantity raised per person employed - -	354	251	247	265
Lives lost - - - - -	19	5	3	7
Persons employed per life lost - -	526	742	833	714
Tons of coal per life lost - - - -	186,316	186,100	206,333	186,857
Lives lost by explosions - - -	1	—	—	—
,, ,, falls of roof - - - -	6	3	1	1
,, ,, falls of coal - - -	7	—	1	4
,, ,, shafts - - - -	2	1	1	2
,, ,, miscellaneous - - -	1	1	—	—
,, ,, above ground - - -	2	—	—	—
Persons employed per life lost by—				
Explosions - - - -	10,000	—	—	—
Falls of roof - - - - -	1,666	1,233	2,500	4,900
Falls of coal - - - -	1,428	—	2,500	1,225
Shafts - - - - -	5,000	3,710	2,500	2,450
Miscellaneous - - - -	10,000	10,000	—	—
Above ground - - - -	5,000	—	—	—
Thousands of tons of coal raised per life lost by—				
Explosions - - - -	3,540	—	—	—
Falls of roof - - - - -	590	311	619	1,308
Falls of coal - - - -	505	—	619	327
Shafts - - - - -	1,770	933	619	650
Miscellaneous - - - -	3,540	933	—	—
Above ground - - - -	1,770	—	—	—

Complete returns of the number of boys between 10 and 12 years of age employed underground have not been obtained. The schedules filled up give an average of 12 for every 1,000 persons employed, which would give a total number of 244 boys. The returns given state that all these boys are able to read and write. Perhaps this view is too favourable as to the whole mines; but I am persuaded that the Act, so far as it goes, is operating beneficially, and that there are not many boys between 10 and 12 years of age, working under ground, but are able to read and write a little. The school fees for such boys range from a penny to twopence weekly. In many cases there are no fees. Where schools are not in connection with the colliery they are convenient to the villages where the workmen reside.

All the circumstances connected with the fatal accidents have been examined by me. The greater number of these accidents, as well as many resulting in serious personal injury, have been reported upon to the Lord Advocate for Scotland.

There has been one fatal explosion. It occurred at Newlands Colliery, by two men going into the face of a place which was driven 10 yards up the "vees" of a hitch, to "chap" or signal to some workmen on the opposite side, who were driving a mine towards it. The "place" was neither fenced off, in terms of the second general rule, nor ventilated, in terms of the first, but contained some fire-damp which exploded at the light of one of the men, burned both,—one fatally, the other slightly. In my Report for 1863 I took occasion to notice what has been a prolific source of explosions, the very dangerous practice of driving fiery bords without brattice, and leaving them unventilated while standing up-stoop. I remarked that air should be conveyed into these places to ventilate them, in terms of the first general rule, while they were driving up, and also to keep them clear while standing up-stoop. I am glad to state that the Lord Advocate has caused an intimation to be made to the coalmasters in this district, that Crown counsel will in future act upon that construction of the statute.

The deaths from falls of roof and coal form 65 *per cent.* of the total fatality. With one exception, these have all occurred through injuries received close to the colliers' working places, and embraced by the clause in the special rules which states that the colliers are bound to prop and secure the roof under which they have occasion to be in their operations of working and filling their coals. In my last Report I pointed out that the responsibility of supporting the roof in the colliers' working places was freely acknowledged and acted upon by the owners of collieries in the north of England, and that the death-rate was lower there than in this district. I beg again to direct the attention of the owners of collieries in this district to the subject, and hope that something may be done for the safety of persons, at least, who require to come within the colliers working limits, but who cannot be held bound to support the roof.

I may state that eight (nearly one third) of the persons killed within the colliers' working limits during the last year were " drawers " and young persons whose duties led them to be at the faces, but who could not be held bound to support the roof.

They were—

No. 2 on list	aged 24	a drawer.
„ 17 do.	do. 12	do.
„ 23 do.	do. 15.	
„ 23 do.	do. 13	a boy working with his father.
„ 26 do.	do. 12	do.
„ 28 do.	do. 17	do.
„ 29 do.	do. 15	do.
„ 34 do.	do. 14	do.

An attempt is now making to introduce machines worked by compressed air, for the purpose of cutting coal under ground. One of those was tried at Redding Colliery in this district, and though not at present in operation it cannot be called a failure. Should these machines be successful, they will effect a saving of life, as with two men to work them they do the work of from 8 to 12 colliers. The machine at Redding was of the kind known as the " West Ardsley coal cutting machine," and a sketch of it is appended (*see next page*). It is simply a large pick worked by a piston driven by air, which is compressed by a steam-engine on the surface to about 50 lbs. on the square inch, and conveyed under ground in pipes. The seam of coal operated upon at Redding was 27 inches thick, with a good roof. The mode of working was by longwall, and the machine was moved on wheels along the line of face. The holing was hard, and well adapted for testing the machine. Two men with the machine did the work of from 8 to 10 colliers in " holing."

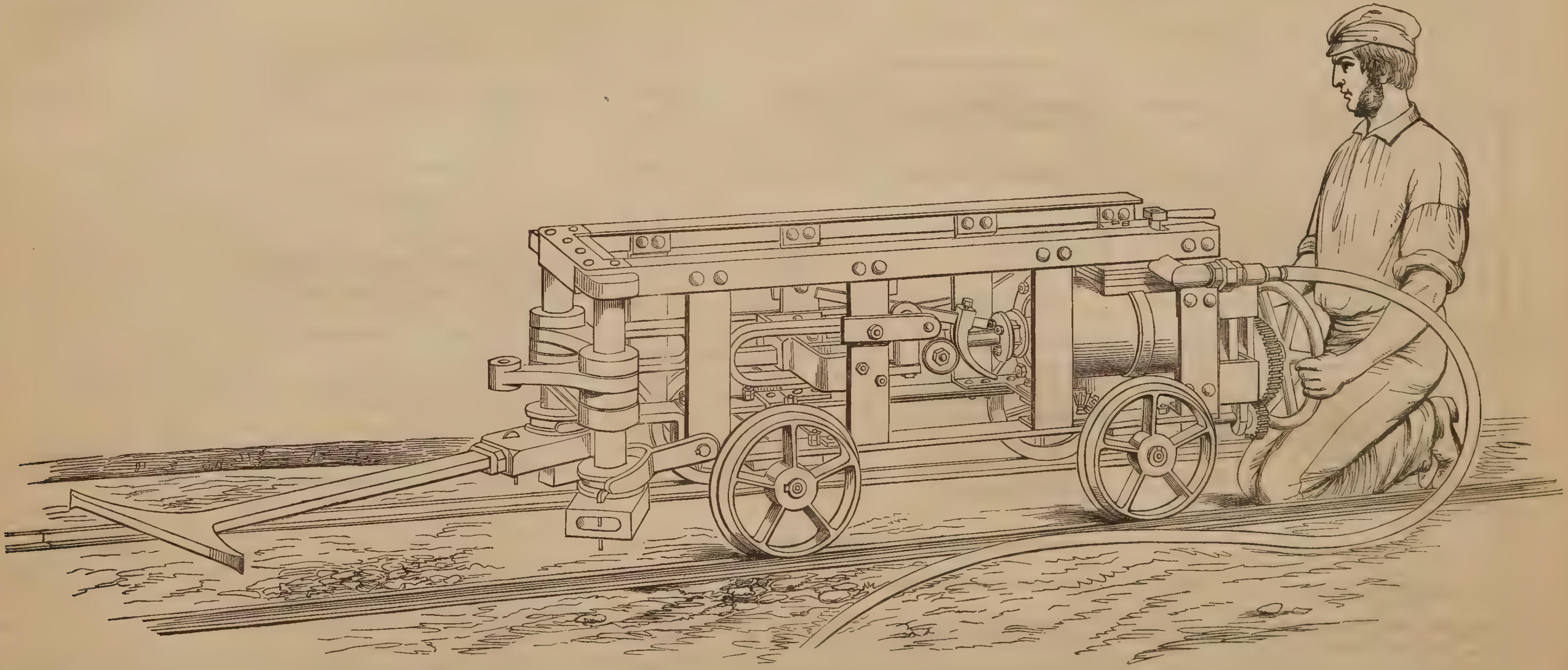
The other fatal accidents are briefly alluded to in the accompanying schedule.

The Act 25 & 26 Vict. c. 79. has now come into general operation, and every working must have at least two outlets. Generally, the owners of coal mines exerted themselves to have these outlets before the end of the year. Those who entered into arbitrations for extension of time beyond the 1st of January, and could show reasonable cause for their request, were allowed an extension of time by the arbitrator.

I have, &c.
Ralph Moore,
Inspector of Mines.

The Right Hon. Sir George Grey, Bart., G.C.B.,
&c. &c. &c.

COAL CUTTING MACHINE.



LIST of the FATAL ACCIDENTS, and LOSS OF LIFE arising therefrom, in COAL and IRONSTONE MINES, in the EAST of SCOTLAND DISTRICT, during the Year ended December 31, 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owner's or Agent's Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives Lost.					
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.														
Jan. 15	1	Newlands	Lanarkshire	Charles Tennant and Co.	John Millar	Collier	—	Explosion of fire-damp	1	–	–	–	–	–
„ 16	2	Stonecraigs, No. 3 pit.	Ditto	Coltness Iron Company	James Bowes	Drawer	26	He was waiting for a loaded hutch at the colliers wall face in splint coal.	–	1	–	–	–	–
„ 27	3	Nackerty	Ditto	Provenhall Coal Company	John Dennison	Collier	—	About 20 square yards of Pyotshaw coal fell unexpectedly on him while working at it.	–	1	–	–	–	–
Feb. 7	4	Wellwood	Fife	Thomas Spowart and Co.	John Bewick	Ditto	40	Crushed by cage	–	–	1	–	–	–
„ 5	5	Capeldrae	Ditto	Robert Aytown	D. McLiesh	Pumper	19	Fell down incline	–	–	–	1	–	–
„ 10	6	Coltness	Lanark	A. G. Simpson	James Forfar	Collier	39	Fall of main coal while taking out pillars.	–	1	–	–	–	–
„ 13	7	Kellie	Fife	Livingston and Co.	George Lang	Ditto	43	Fell out of kettle while ascending pit.	–	–	1	–	–	–
Mar. 8	8	Rochsolloch	Lanark	George Cowie	Thomas Welsh	Ditto	35	Fall of coal in Kiltongue seam	–	1	–	–	–	–
„ 16	9	Pather	Ditto	Boyd and Spencer	William Henderson	Trimmer	13	Fell in before waggons	–	–	–	–	1	–
Apr. 7	10	Garriongill	Ditto	Coltness Iron Company	John Munro	Collier	19	Fall of roof in splint coal	–	1	–	–	–	–
„ 11	11	Balgonie	Fife	Charles Balfour	John Hutcheson	Ditto	18	Fall at face of "head coal"	–	1	–	–	–	–
„ 16	12	Carnbroe, No. 8	Lanarkshire	Merry and Cunningham	R. McWhinnie	Ditto	45	Fall at face, splint coal	–	1	–	–	–	–
„ 25	13	Blackbraes	Sterling	James Russel and Son	James Marshal	Ditto	—	Fall at face, splint coal	–	1	–	–	–	–
„ 30	14	Penston	Haddington	John Deans, junior	George McCulloch	Ditto	22	Fall of "brushing" (roof) at face	–	1	–	–	–	–
June 11	15	Alloa	Clackmannan	Alloa Coal Company	Thomas Sneddon	—	25	Fall of coal at face	–	1	–	–	–	–
July 2	16	Cleland, No. 39 pit.	Lanark	Robert Stewart	Thomas Cassidy	Drawer	35	A hutch from a higher level ran over him while he was going out with a loaded hutch.	–	–	–	1	–	–
„ 4	17	Cleland, No. 3	Ditto	William Dixon	H. Kennedy	Ditto	12	Fall of coal (working with his father).	–	1	–	–	–	–
„ 23	18	Fernigare	Ditto	Fermgare Coal Company	John Gilchrist	Labourer	64	Killed by crane handle, crane ran amain.	–	–	–	–	1	–
Aug. 15	19	Morningside	Ditto	James Bennie	George Lindsay	Collier	32	Fall of roof at face	–	1	–	–	–	–
„ 15	20	Merryton	Ditto	Brand and Cochrane	Dun. Fleming	Roadsman	34	Killed by a fall of roof while repairing horse road.	–	1	–	–	–	–
„ 8	21	Penston	Haddington	John Deans, junior	N. Jamieson	Collier	20	Fell off a vertical ladder while descending a pit 19 fathoms deep.	–	–	1	–	–	–

List of Fatal Accidents in Coal and Ironstone Mines—*continued.*

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owners' or Agents' Name.	Persons killed.	Occupation.	Age.	Cause of Death, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Roof.	In Shafts.	Miscellaneous.	Above ground.	Total.
1864.														
Aug. 29	22	Weymss	Fife	H. E. Wemyss	R. Scott	Collier	44	Fall of coal	–	1	–	–	–	–
„ 30	23	Sunnyside	Lanark	Archibald Russel	Robert Smith	Drawer	15	Fall of Pyotshaw coal	–	1	–	–	–	–
Sept. 13	24	Overton	Ditto	John Wilson	Robert Lennox	Collier	13	Fall of coal. (Worked with his father.)	–	1	–	–	–	–
Oct. 29	25	Skellyton	Ditto	Hamilton and McCulloch	George Arbuckle	Ditto	25	Fall of top coal	–	1	–	–	–	–
„ 31	26	Preston Grange	Haddington	Sir G. Grant Suttie	Thomas Gordon	Ditto	12	Fall of coal	–	1	–	–	–	–
Nov. 3	27	Redding	Stirling	Redding Coal Company	George Hunter	Ditto	—	Overwinding. Engineman drunk	–	–	1	–	–	–
„ 4	28	Shieldhall	Ditto	Carron Iron Company	Robert Brown	Ditto	17	Fall of roof	–	1	–	–	–	–
„ „	29	Ditto	Ditto	Ditto	Andrew Brown	Ditto	15	Ditto	–	1	–	–	–	–
„ 8	30	Coltness	Lanarkshire	A. G. Simpson	Robert Simpson	Bottomer	56	Falling down pit from a mouthing	–	–	1	–	–	–
„ 7	31	Rochsolloch, No. 2	Ditto	George Cowie	John Crookston	Collier	36	Fall of roof	–	1	–	–	–	–
„ 23	32	Cuttlehill	Fife	Henderson and Wallace	Thomas Hodge	Ditto	20	Ditto	–	1	–	–	–	–
Dec. 10	33	Overton, No. 3 pit	Lanarkshire	John Wilson	Owen Cullen	Drawer	25	Crushed by cage while attempting to cross pit-bottom instead of going by road.	–	–	1	–	–	–
„ 9	34	Shieldhall	Stirling	Carron Iron Company	Robert Thomson	Ditto	14	Fall of roof while taking out stoops	–	1	–	–	–	–
								Total loss of life in coal mines	1	23	6	2	2	34
					IRONSTONE MINES.									
Jan. 31	1	Comrie	Perth	Forth Iron Company	Robert Duncan	Miner	—	His foot got entangled in a chain which was being run out, and his leg was taken off. He died three days afterwards.	–	–	1	–	–	–
Feb. 3	2	Colinshields	Linlithgow	Shotts Iron Company	James Finlay	Ditto	22	Fall of roof at face	–	1	–	–	–	–
Sept. 27	3	Comrie, No. 16 pit	Perth	Forth Iron Company	James Glavin	Driver	14	Crushed by hutches	–	–	–	1	–	–
April 26	4	Ditto	Ditto	Ditto	David Crichton	Roadman	—	Jammed by cage while repairing shaft.	–	–	1	–	–	–
Oct. –	5	Barbauchlau	Linlithgow	Monkland Iron Company	James Weir	Miner	59	Fall of stone at face	–	1	–	–	–	–
								Total loss of life in ironstone mines	–	2	2	1	–	5
								Total in coal and ironstone mines	1	25	8	3	2	39

Mr. Alexander's Report.

Report on the Inspection of Mines in the Western District of Scotland, for the Year ended 31st December 1864.—By William Alexander, Esq.

Sir, Glasgow, 27th February 1865.

I have the honour to lay before you my Ninth Annual Report upon the collieries and mines in the western district of Scotland.

By the Act 25 & 26 Vict. c. 79, now incorporated with 23 & 24 Vict. c. 151, another important addition has been made to the list of general rules. It provides that after the 1st day of January 1865 it shall not be lawful to work any mine or colliery, unless there are in communication with every seam of such mine for the time being at work at least two shafts or outlets. The object aimed at being to secure a means of egress at all times for the persons who may be employed therein.

Judging from the replies of the Inspectors of mines in 1862 to a circular letter addressed to them on the subject of shafts, the changes required to render a full compliance with the statute will be felt more throughout this district than in any other mining division in the kingdom. As hitherto the practice, nearly universally observed, has been to win and work the seams by single bratticed shafts.

The system, however, is not peculiar to Scotland, at least it cannot have originated there; our old collieries of 70 or 100 years ago bear sufficient evidence to the contrary. The pits of that time being either circular or oval, and abundantly numerous for all double shaft purposes.

It is difficult to conceive what should have induced the change, or introduction of bratticed shafts. The only advantage that could be claimed for this dubious system was the difference of cost; it must have been purely a pecuniary question, but except in very limited fields, the saving was, perhaps, more apparent than real.

Previous to the introduction of guides and cages the brattice or midwall in a single shaft was a constant source of annoyance, being subjected to many accidents from the continual wear of the loose corves or baskets knocking against it while being raised and lowered. And as one division formed an inlet for the air to the mine, and the other an outlet, any defect in the brattice or midwall was detrimental to the ventilation.

Under such a system the pit-bottom arrangements were complicated, trap doors were indispensable, and on account of their proximity to the shaft, it was practically impossible during working hours to prevent a certain amount of leakage.

Consequently, at the majority of pits, a considerable portion of the ventilation never made the circuit of the mine at all. At small works where, comparatively speaking, less attention was given to this division of management, it is scarcely necessary to observe that the defects of the system were much more visible.

The furnace being the usual means employed for producing and maintaining ventilation, and necessarily heated up to a high temperature, was, from its nearness to the pit-bottom, the cause of many accidents, and not unfrequently the midwall and woodwork in the shaft got damaged or destroyed by ignition.

On such occasions, and unless the fire was promptly attended to, the coal in the immediate vicinity of the pit became ignited, and in some cases to such an extent that the only way of subduing the fire and preserving the mine was to allow water to collect in the works, or shut up the shaft so as to prevent the process of combustion.

Many narrow escapes were made in this way, but as such accidents were *most* likely to occur during the hours that the workmen were absent, it did not often happen that lives were lost. However, such occurrences did not always pass off simply with damage to property, and the case of the Dykehead Colliery, near to Hamilton, was a painful illustration.

In the event of an extensive explosion it may not always happen, under the double shaft system, that the persons not destroyed by the fire and the blast will be able to escape from the effects of the after-damp; but in the case of a single shaft, under such conditions, escape would be nearly impossible.

Something, however, will depend on the situation of the shafts. It would scarcely be possible to lay down a rule applicable to all cases further than providing, as the Act does, for a perfect separation, but as an approximation to such where there are only two shafts the one should be situated at some distance to the "rise" of the other.

Such an arrangement might be of advantage in the event of an explosion of fire-damp, but in the case of an irruption of water it could not fail to be; as the water would collect first in the "dip" or lower parts of the mine, time would thus be gained for the workmen to make their escape by the outlet or pit to the "rise."

By the 4th section of the statute (25 & 26 Vict. c. 79) provision was made for parties whose fields were nearly exhausted, or otherwise in such a position as not to warrant the sinking of a second shaft, to claim exemption by referring the matter to arbitration.

There were three claims for exemption, but after consideration they were either withdrawn or not pressed for arbitration.

This section also provided in a similar way for extension of time to complete a second shaft or outlet.

There were eighteen applications under this head, four were refused a hearing, and fourteen cases went to arbitration. In four of these no extension of time was granted; and in ten, time varying from one to twenty months was allowed to complete the connections.

The number of separate workings in operation throughout this district at the passing of the Act, and depending upon single shafts as a means of egress, was 304. Of these, I only know of *two* which have been stopped, apparently on account of the cost which would require to be incurred to form the necessary openings or outlets. The works are of small extent, and in the case of one of them, it is questionable whether the consideration of outlay was the only cause of abandonment.

The special advantage aimed at by this statute, to secure at all times a means of outlet for the persons who may be employed in mines, will, I believe, seldom fail to prove effective in the collieries of this district.

The measure is popular with *all who require to go underground*, and excepting the question of expense, I have not heard a reasonable objection raised against it.

Apart from the security thus provided, I believe time will prove the double shaft provision to be the best and most effective which has yet been introduced for improving the ventilation of mines, and ultimately the physical condition of the miner.

In consequence of sinking new shafts, for the purpose of forming a second means of egress, and making connections through old and abandoned workings, a great deal of extra or irregular work has been performed.

It is satisfactory however, to know that even under such conditions, the number of casualties has been as low as during any of the preceding years.

For the past year the number of collieries in operation has been 220, and I estimate the quantity of coal produced from them at 6,300,000 tons.

The fatal accidents in and connected with these works have been 31, causing the loss of 35 lives. Of these 25 were married men, and 10 were unmarried.

In the schedule annexed, No. 1, these accidents are shortly detailed, and the comparative result of the last nine years' inspection is exhibited in the following abstract

——	Explosions.		Falls of Coal and Roof.		In Shafts.		Miscellaneous and above ground.		Total of Accidents.	Total of Deaths.	Computed number of persons employed.	Persons employed per separate fatal Accident.	Persons employed per Life lost by the Accidents.	Computed quantity of Coal raised.	Tons of Coal raised per separate fatal Accident.	Tons of Coal raised per Life lost by the Accidents.
	Accidents.	Deaths.	Accidents.	Deaths.	Accidents.	Deaths.	Accidents.	Deaths.								
														Tons.		
Average for the 5 years ending 1860	6	8⅘	20⅖	21	11⅗	12⅕	3⅕	4⅕	41⅕	46⅕	16,190	392	350	5,556,579	134,868	120,272
„ 1861	4	4	21	21	7	7	4	5	36	37	17,795	494	480	6,100,000	169,444	164,864
„ 1862	2	3	26	26	4	5	3	4	35	38	17,935	512	471	6,200,000	177,142	163,157
„ 1863	3	4	19	19	5	5	4	4	31	32	18,073	583	564	6,300,000	203,225	196,875
„ 1864	3	5	14	15	11	11	3	4	31	35	18,073	583	516	6,300,000	203,225	180,000

The fatal accidents which took place in the ironstone mines of the coal measures, and worked in connection with coal, or with any disused or exhausted coal mine, were 14; of these nine were married men, three were single or unmarried, and two were boys.

These accidents are explained shortly in schedule No. 2, and the following abstract shows a comparative result for the last four years:—

Year.	Explosions.		Falls of Ironstone and Roof.		In Shafts.		Miscellaneous and above ground.		Total of Accidents.	Total of Deaths.
	Accidents.	Deaths.	Accidents.	Deaths.	Accidents.	Deaths.	Accidents.	Deaths.		
1861 - -	–	–	6	6	3	3	3	4	12	13
1862 - -	1	1	3	4	8	9	6	6	18	20
1863 - -	2	2	6	6	4	5	5	5	17	18
1864 - -	1	1	5	5	3	3	5	5	14	14

The accidents in collieries occasioned by explosions of fire-damp have been three in number, the same as for the year preceding.

As it is frequently observed, that the workmen from rashness or otherwise neglect precautionary measures, and aid in bringing about these calamitous results, I think it but fair to remark that for the year now ended no such charge can be made.

In one case, apparently no one could be blamed with culpable neglect of duty, but in the other two there was in each case a direct violation of the special rule which provides for a careful examination of the works by a properly qualified person before the workmen are allowed to enter them.

I took occasion in previous reports to refer to the importance of having the underground works carefully examined by a competent fireman before the workmen were allowed to enter them, and to point out that no person, with the exception of the officials, should be *lowered* into a pit in the morning till after the fireman had made his examination and signalled to the surface to that effect.

With your approval, a slight addition has been made to the special rules established for the collieries of this district since October last.

The change is not great, it only enforces what has hitherto been understood to be observed at all well-regulated works.

It provides that the engineman shall not allow the descent of workmen into the colliery on any morning till after the fireman has completed his underground examination and has signalled to the surface to that effect.

By this arrangement a thorough check is secured in so far as that no collier can proceed to his working place unknown to the fireman, or before he has had time to complete his examination.

The falls of coal and roof have been fewer for the past than for any preceding year. This favourable result must be principally owing to greater care on the part of the workmen themselves, by their propping and securing the roof while working under it, and to increased supervision on the part of the management.

I have before expressed the opinion, that the workmen are the best judges as to the state of the roof in their working places,—that it is a judicious arrangement to provide that they protect themselves in the limit above described, which in this district is fixed not to exceed fifteen feet back from the face in stoop and room working, and twelve feet in longwall. It fosters a certain amount of self-reliance, and, in matters relating to that particular department, makes a more intelligent and useful workman.

These accidents are peculiar to all mines, they follow no regular order, happening in many cases unexpectedly, and contrary to all previous experience. There are generally admitted precautionary measures, however, which should never be neglected.

If a seam of coal is mined in two divisions, it is unsafe to work under the upper, unless it be secured with wood. While excavating under the longwall system, there is a constant action along the face of the coal, induced by the overlying weight, and particularly when undermining, tending to force it down. Among observing and experienced workmen advantage is taken of this, and it is the practice to undermine the coal along the face of their wall during the day and leave it to be acted upon by the overlying weight during the night.

The economy of this arrangement is apparent, and it generally happens that the coal thus prepared is forced down, or nearly so, by the time the workmen return.

It sometimes happens, however, that during the time a face of coal is being undermined a sudden fall takes place, induced by some natural rent or "back."

To guard against this, short sprags or gibs are introduced at reasonable distances from each other, and these either check a sudden fall or allow the workmen sufficient time to protect themselves or effect their escape.

As a general rule, a collier should support the roof throughout the whole of his "working place," without considering whether it requires direct support or not; and innumerable cases might be adduced to prove that falls frequently occur where a roof is comparatively good.

If the material of which a roof is composed be strong, it generally gives a certain amount of warning before falling, but it is easy to conceive that this warning, or premonitory symptom, may in many cases take place at night or during the miners' absence.

The accidents in shafts have increased in number during the past year. This, to a certain extent, can be accounted for, as already explained, in consequence of the number of additional shafts being formed in compliance with the requirement of the statute 25 & 26 Vict. cap. 79.

Mid-workings are a constant cause of accidents in shafts, it is scarcely possible to protect them with fences during working hours. Under such conditions the most effective way is to concentrate the operations by "crosscuts," or otherwise, into one or two levels, where a fixed scaffold could be placed, or provide for winding from different levels, at certain times, where moveable scaffolds could be introduced.

It is of importance to have the space around the pit bottoms clear and roomy, so that the persons engaged in them may move about with ease and freedom.

The special rules carefully provide that the bottomer shall see the workmen properly on to the cage before it is raised; but through rashness and indifference, persons get crushed by the cage, or by coming in contact with the shaft, while being raised and lowered.

Covered cages ought to be used in *all* winding shafts; they form a great protection in case of anything falling, and I believe save a number of lives annually.

The casualties of a miscellaneous kind were three. The first happened upon an underground incline, by the rope breaking. The sufferers were in this case acting contrary to the rules of the colliery. The second took place while blasting, by the deceased going hurriedly back into his working place before the shot had exploded; and the third, by a bottomer passing improperly across the bottom of the shaft, where he got struck by the descending cage.

Other fatal cases investigated by me, connected with mines, but not coming under the provisions of the statute, do not appear in this record.

The casualities of a serious kind, causing personal injury, as exhibited by the results for the last three years, appear to be increasing.

Year.	Explosions.	Falls of Coal, Ironstone, and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total of Non-Fatal Accidents.
1862	84	85	11	35	6	221
1863	88	97	10	38	6	239
1864	105	117	10	27	7	266

In practice, I am not aware that there is an actual increase, and perhaps the difference may be accounted for by that part of the Act becoming better understood which provides that all cases of serious personal injury should be duly reported.

Of the explosions a number were trifling, and in some cases the persons injured had scarcely been detained a day from their work.

It is of importance, however, to report all such accidents; it enables the manager as well as the inspector to draw attention, if need be, to the details of ventilation, and check irregularities which, if left alone, might in time lead to unfortunate results.

With the view of attracting the attention of those more immediately connected with carrying out the discipline and details of the mine, I have explained more fully the following cases, selected from schedules 1 and 2.

Accident No. 1, *schedule No.* 1, *was occasioned by the breakage of a rope upon an incline.*

The seams being worked at this colliery are situated to the "dip" of the pit. The main drawing road driven to the dip is formed in the lowest seam. The deceased, father and son, worked in this seam. It appears that on the morning of the accident they had gone in to a train of hutches about to be lowered upon the incline above described. They had advanced only a short distance when the wire rope, to which the hutches were connected, suddenly broke, and they were precipitated towards the bottom of the dook, and dashed with violence against the timber placed along the sides of it.

The rope in this case was employed wholly for winding coals and at the part where it broke was considerably worn.

There was a roadway, distinct from the incline, for the workmen to travel upon, and it was contrary to the regulations of the colliery for any one to ride in the hutches.

Accident No. 6, *schedule No.* 1, *was occasioned by falling from a scaffold in a sinking pit.*

The deceased was a sinker, and on the morning of the accident he and three other workmen commenced their shift in the usual way. On being lowered to the pit bottom they discovered that the scaffold, worked by a crane from the surface, and on which the repairs, &c., in the shaft were made, had got damaged, it was supposed by blasting during the preceding night. Towards the close of the shift it was found necessary to overhaul the pumps, when instead of sending the broken scaffold away to be repaired before being used, or otherwise providing something secure to stand upon, two of them thoughtlessly got on to it, and were drawn up the shaft, when, shortly after, the connection at one side of it gave way, the deceased lost his footing, and fell to the bottom a distance of 60 feet or thereby.

Judging from the shattered appearance of the scaffold, at the time of my examination, it must have been unfit for use; and it is difficult to conceive how men accustomed to pit work could have been so indifferent as to trust themselves upon so insecure an erection.

Accident No. 8, *schedule No.* 1, *was occasioned by falling from a midworking.*

There were two seams of coal being worked in this shaft. The upper at 46 fathoms and the lower at 66 fathoms. The cages were raised from and lowered to the lower seam, but it was the practice when a hutch required to be raised from the upper seam that a signal was made to the engineman to stop the cage at it.

It appears that the deceased, who worked in the upper seam, had made the necessary signals in this case. There was no person along with him at the time, but it was found that the cage had accordingly been raised and rested at the level of the (major) upper seam, and he had removed the empty hutch which was upon it. However in returning with his full hutch to place it upon the cage, he had inadvertently pushed it in to the wrong division of the shaft, instead of the one where the cage was rested, and fell down with it to the bottom, a distance of 20 fathoms.

It is always dangerous to send away materials from a midworking, where, as in the present case, there is no scaffold to prevent persons or hutches from falling, and under such circumstances the safe way is to arrange a scaffold over one of the divisions of the shaft at the upper or midworking, leaving the other open but fenced off so as to prevent any person from unknowingly passing in to it.

There were gates on the pit at the upper seam, but there was no particular person to look after them.

Accident No. 14, *schedule No.* 1, *happened while the deceased was being lowered in the shaft.*

The deceased was a roadsman, and I understand that on the morning of the accident he and other two workmen were lowered to the level of the upper seam. His neighbours went off there, and he caused the usual intimation to be made to the surface for the purpose of having the cage lowered to the major or mid seam, where it is supposed he intended to go off.

It is conjectured that the cage had not been lowered quite far enough to enable him to pass off in the usual way, and that he had been in the act of attempting to get out of the cage by the end of the shaft, when it was raised, and he was crushed between it and the woodwork placed there.

In this case there was a direct violation of the special rules. There were two actions raised by the Procurator Fiscal. The pitheadman, for neglect of duty (not being in attendance when the shift commenced), was sentenced by the Sheriff to 10 days' imprisonment, or pay a fine of 20*s.*; but the second case is still before the court.

Accident No. 19, *schedule No.* 1, *was occasioned by an explosion of fire-damp.*

The deceased was night fireman, and it was his duty to examine the works before the workmen were allowed to enter. It appears that on the evening of the accident he had descended the shaft, and in the course of his examination ignited a quantity of fire-damp, by which he was severely injured and died from the effects of it.

It was understood that the unfortunate sufferer had in this case been making a hurried examination with a naked light when the explosion took place.

Accident No. 20, *schecule No.* 1, *was occasioned by an explosion of fire-damp.*

At the time of the accident the deceased was engaged taking out a pillar of coal situated at a short distance from the bottom of the shaft.

I understand that he had worked for three hours previous to the accident, and that the place had been free of fire-damp when he commenced.

The waste was limited and fairly ventilated.

I was of opinion that the gas which caused the explosion had been secreted in a high part of the broken roof, beyond the point where the deceased was engaged, unknown to anyone, and was dislodged by a fall of roof in some part of the exhausted waste, and in that way forced into contact with his naked or unprotected light.

Accident No. 21, *schedule No.* 1, *was occasioned by an explosion of fire-damp.*

This accident happened in the lower or Kiltongue seam. The workings were limited, being confined to two levels and a pair of headings.

The headings were principally worked for the purpose of forming a communication with a "rise" pit, to meet the requirements of the Act 25 & 26 Vict. c. 79.

According to the special rules of the colliery, it was the duty of the fireman to descend the shaft and examine the working places before the colliers were allowed to proceed to their work.

It appears that he had gone down the pit on the morning of the accident, and examined the levels, but according to some arrangement which had been made with two men who contracted to drive the headings, his examination did not extend to these places; that is, they had agreed to examine the headings for fire-damp to suit themselves.

Such an arrangement, though apparently not insecure, has been often proved objectionable, and the present case is a very fair illustration.

The fireman (Love) examined the two levels, but did not proceed into the headings, because the contractors were expected to inspect these places for themselves. The contractors arrived soon after the fireman, and I understand that one of them went into the west heading with an unprotected light (the safety-lamp which he should have used was found after the explosion lying in the case) and there ignited a quantity of fire-damp, by which an intense explosion was produced, resulting in the death of three persons, and serious injury to others.

If (Sneddon) the person who contracted to drive the headings, had taken the precaution to examine them with a safety-lamp, the accident would not have happened; but it is well known that workmen, perhaps little accustomed to the use of safety-lamps, are apt to act incautiously, and they should not be intrusted with such an important duty; for in making an improper examination, it may be of only a single place, they not only expose themselves to danger, but others who have no control over them.

The special rules admit of no such modification, and it would be absurd to allow the regulations established for the general safety, to be set aside at pleasure. If such a practice was admitted, it would be equally safe in a pit where a number of workmen were employed, to make each collier his own fireman, and this would only be carrying out, on a more extensive scale, the system which appears to have been acted upon on this occasion.

It is of the utmost importance to those who work in mines, that the regulations relating to fire-damp should be strictly adhered to, and that every working-place should be carefully examined in the morning before the workmen are lowered into the mine at all.

Accident No. 31 *was occasioned by the cage being lowered upon the deceased while he was crossing the shaft.*

The deceased was bottomer at the colliery, and, in addition to his ordinary duties, he had charge of the ventilating furnace, which was situated near to the bottom of the shaft.

It appears that on the day of the accident he had gone to the furnace, by crossing the shaft, and in returning he was caught by the descending cage and crushed under it.

There was a roadway formed round the end of the shaft, and it was the proper and safe course to pass to the furnace.

Accident No. 1, *schedule No.* 2, *was occasioned by recklessly attempting to cross the mouth of the shaft.*

It appears that the pit had been stopped at the new year holidays, for the purpose of making alterations; and the tools employed below ground had been sent up, so as to enable the workmen to get employed elsewhere.

The deceased, on the day of the accident, had gone to the pit in a state of intoxication, it is supposed for the purpose of removing his tools, and while attempting to cross the shaft to get into the engine-house he missed his footing, and fell to the bottom, a distance of 86 fathoms.

Accident No. 5, *schedule No.* 2, *was occasioned by the accidental discharge of a shot while stemming or ramming it.*

The deceased had along with his neighbour been engaged preparing to blast. They had formed a borehole, and charged it with the usual quantity of gunpowder, and while ramming it the powder was accidentally ignited. The unfortunate sufferer received the contents of the shot right in his face.

This description of accident is of frequent occurrence, and as long as iron needles and stemmers are used it will continue to happen.

Accident No. 6, *schedule No.* 2, *was occasioned by an explosion of fire-damp.*

This accident happened in one of the usual working places of the mine. It appears that a small quantity of fire-damp lodged occasionally in the roof of the wall, and at the head of the roadway leading in to it.

Contrary to the special rules of the colliery, the deceased, who worked in this place, had been in the habit of waffing out the fire-damp when it was known to exist. And on the morning of the accident I understand that he and his neighbour had been engaged driving it out, and along the face, when the workmen employed in the adjoining wall ignited the fire-damp on passing in to their work.

It seems that the fireman had examined the place in the morning, he knew of the fire-damp, and acquainted the deceased and his neighbour as to the extent of it.

By rule 21 of the special rules, it was his duty to see that the places were in a fit state for working in before allowing the workmen to enter.

Accident No. 10, *schedule No.* 2, *happened upon an engine plane.*

The deceased was a mere child, 10 years of age, and it was his duty to open a door placed upon an engine plane to allow the passage of empty and loaded hutches.

It appears that at the time of the accident he had either left the door or the place where he usually remained, while the train of hutches was passing, and getting entangled with the rope or hutches, received injuries which caused death soon after.

Accident No. 12, *schedule No.* 2, *was occasioned by blasting.*

This accident happened while the deceased, contractor of a stone mine, was in the act of blasting. I understand that after igniting the match, he and the workmen engaged with him, retired for protection to a partial recess in the side of the mine, about 50 yards distant. But, unfortunately, part of the rock, displaced by the blast, was driven right out of the mine in the direction of the deceased, and coming in contact with him caused injuries which instantly proved fatal.

With reference to the means adopted for the education of boys under 12 years of age employed in mines, and to which you directed my attention in November last, I can only repeat the observations which I have had occasion to make in previous communications.

The means of education is within the reach of every family, and the only inconvenience that can occur in the way of attendance, is where a colliery is isolated and too small to support a teacher. In such cases the children belonging to the workmen may possibly

possibly require to travel an inconvenient distance, but the same hardship presses less or more upon every family resident in the country, such as farmers, or others who live in detached villages not sufficiently important to support teachers.

There are schools in connection with all collieries of any extent; and those established at iron works, and large mining concerns, are generally ably conducted by male and female teachers; and in 1862 as many as 42 schools throughout the mining districts here came under the inspection of Government, and received aid from the Privy Council Committee.

The fees are moderate, and it is the custom where the schools are in connection with the works, to make a deduction off each workman for the education of his family. The scale of charges is not uniform, but at some works it is as low as twopence a week; that is, a workman by paying twopence a week, or at the rate of 8*s.* 8*d.* a year, may have the whole of his family educated without regard to number.

Few cases come under my observation of boys being employed in mines under 12 years of age who cannot read and write. Their labour is of no consequence to any one, except to their parents; and as a certain amount of responsibility rests with the owners, where such boys are engaged, as to certificates of age, attendance at school, &c., some of the largest employers have instructed their managers not to employ any boys under 12 years of age unless they can read and write.

The provision for enabling young boys employed underground, to attend school three hours a day for two days a week is not taken advantage of, it is unpopular, and in my opinion not applicable to mining.

It would be unfeeling to send a boy of 10 years of age to a night school after his having laboured 10 hours a day under ground, and apparently it would be impracticable to introduce the factory system of half time.

The mining population in particular ought to have a certain amount of education before they are admitted into the mines at all; and referring to sections 1 and 2 of the statute 23 & 24 Vict. c. 151, it would simplify the working of the Act if boys were excluded from working under ground until they were 14 years of age, or had reached the age of 12 years, and could read and write.

It is to be regretted that the Glasgow school of mines, which existed for nearly five years, has, for want of support, been closed since July last. Such an institution, designed for the improvement of workmen practically acquainted with the minutiæ of mining, and where they might acquire the groundwork of mining engineering, could scarcely fail to prove beneficial to a mining district.

It had the effect of dissipating prejudice, and spreading a general knowledge of the various modes of working, and the schemes introduced from time to time to economize labour, or meet the peculiarities of local districts. As it is, improvements travel slowly, and not unfrequently important ones are practised for a considerable time in one colliery before they are introduced into the work adjoining.

An inspector of mines has an unusually good opportunity for observing the various modes of working practised, and of noting and comparing the results obtained; he can occasionally be the medium of communication, and while the greater part of his report must necessarily relate to the accidents and irregularities which take place in mines, it may not be beyond his province to remark upon the economy of the mine also.

The capital employed in mining enterprise is enormous, and the return, considering the precarious nature of the investment, is inadequate.

Referring to this district, the mineral field is now generally known, and well defined. As the easily obtained seams are becoming exhausted the works are gradually being extended to new fields, less accessible, and more difficult to win.

Modern improvements may qualify this, but unquestionably the cost of production is advancing.

The seams of coal lying in the upper series of the coal measures are by far the most valuable. They are peculiarly well situated for economical mining, and hitherto the operations have been principally confined to them.

From their thickness, ranging from $3\frac{1}{2}$ to 8 feet, they have, with few exceptions, been worked upon the stoop and room system, and from a fourth to a half of the whole has been left in pillars.

In some cases these stoops have been partially obtained by cutting through them or otherwise working what could be obtained in a cheap and ready way; but unfortunately the pillars in first working having been only meant to support or maintain the roof, and were never intended to be worked away, the coal obtained under such a condition forms but a very small proportion to that irrecoverably lost.

Placing it simply as a question of economizing the mineral field, the mode of working best fitted for accomplishing such an end would be to work the whole of the seams by the longwall system. By it the coal is wholly gained, and in the most marketable state; and the only objection I know of that can be urged against the practice of this judicious mode of working is that it is not always the cheapest for a tenant.

When a seam of coal exceeds a given thickness, in general, it might be more economically worked by some mode of pillar working, arranged so that the pillars could be taken out as the workings in the solid advance.

Of course there are peculiarities about all mineral fields which necessitate modifications, but the system which approximates the nearest to longwall is the most desirable.

Unless a lessee is bound by his lease to carry out a particular mode of working, it is reasonable to expect that he will prosecute that by which the greatest and most direct return can be obtained.

While it is not always the interest of the lessee to work by the longwall system, it is invariably the interest of the mineral proprietor that he should. In the case of the former, unless compelled or otherwise induced he will not always practice it; and in the case of the latter apparently he will not enforce it.

As they are the only parties to the question, it is evident that under such a system much valuable coal may be frittered away or lie buried in a mine, lost for ever without benefiting any one.

This questionable extravagance, or waste, may go on, under existing arrangements there is nothing to check it. It will first have the effect of impoverishing localities by changing the seats of manufactures, but ultimately in beggaring the nation in the matter of a cheap and plentiful supply of fuel, which to a manufacturing country is indispensable, and particularly to Great Britain, whose varied manufactures now compete in every market in the world.

I have, &c.
William Alexander,
Inspector of Mines.

To the Right Hon. Sir George Grey, Bart.,
Her Majesty's Secretary of State, London.

SCHEDULE No. I.

LIST of the FATAL COLLIERY ACCIDENTS, and LOSS OF LIFE arising therefrom, in the WESTERN DISTRICT of SCOTLAND, during the Year ended 31st December 1864.

Date.	No. of Accident.	Name of Colliery.	Where situate.	Owners' Names.	Persons killed.	Occupation.	Age.	Cause of Deaths, and Remarks.	Number of Lives Lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1864. Jan. 16	1	Wellwood, No. 1 pit.	Muirkirk - -	William Baird and Co. -	Andrew Steel -	Collier -	56	By the breakage of an incline rope while riding in the hutches attached to it, contrary to orders.	–	–	–	1	–	1
„ „	—	Ditto - -	Ditto - -	Ditto - - - -	Peter Steel - -	Ditto -	21	Ditto - - - - - -	–	–	–	1	–	1
„ 28	2	Bredisholm -	Baillieston -	John Young - - -	Michael Ward -	Ditto -	39	Fall of roof at face - - -	–	1	–	–	–	1
Feb. 20	3	Stevenson -	Stevenson -	Merry and Cunningham -	David Niven -	Engineer -	45	By a column of "steam jet" pipes falling away upon him in the shaft while engaged securing them.	–	–	1	–	–	1
Mar. 8	4	Govan, No. 5 -	Glasgow - -	W. S. Dixon - - -	William Keith -	Collier -	40	Fall of coal - - - - -	–	1	–	–	–	1
„ 9	5	Hillhead, No. 3 pit.	Kilmarnock -	John Gilmour and Co. -	Peter Whyte -	Bottomer -	45	Fell from a mid working in consequence of the cage having been removed without a signal.	–	–	1	–	–	1
„ 10	6	Gauchalland, No. 4.	Galston - -	Gauchalland Coal Company	Joseph Linton -	Sinker -	50	Fell down the pit, which was in the act of being sunk, by the scaffold giving way.	–	–	1	–	–	1
May 5	7	Carnachan, No. 2	Patna - -	Dalmellington Iron Company.	David Bennie -	Collier -	20	Fall of coal - - - - -	–	1	–	–	–	1
„ 21	8	Portland, No. 5	Hurlford - -	William Baird and Co. -	James McCartney	Ditto -	17	By falling down the shaft from a "mid" working.	–	–	1	–	–	1
„ 21	9	Stevenson -	Stevenson -	Merry and Cunningham -	Philip Cairns -	Redsman -	30	Fall of roof - - - - -	–	1	–	–	–	1
„ 25	10	Coney Park -	Kilsyth - -	John Barr - - -	Patrick Samson -	Sinker -	34	By a piece of wood falling upon him in the shaft.	–	–	1	–	–	1
„ 27	11	Govan, No. 4 -	Glasgow - -	W. S. Dixon - - -	John Muir - -	Ditto -	26	By a scaffold falling upon him in the shaft.	–	–	1	–	–	1
„ „	12	Fergushill, No. 19	Kilwinning -	Archibald Finnie -	Peter Stewart -	Collier -	38	Fall of roof - - - - -	–	1	–	–	–	1
June 4	13	Ditto No. 17	Ditto - -	Ditto - - - -	John Richmond -	Oversman -	42	Fall of roof (in an air course) -	–	1	–	–	–	1
„ „	14	Hurlford, No. 12	Hurlford - -	Allan Gilmour and Co. -	John Ross - -	Roadsman -	58	Crushed between the cage and the shaft.	–	–	1	–	–	1
„ 11	15	Bargeddie, No. 1	Baillieston -	Bargeddie Coal Company	James Inglis -	Collier -	38	Fell off a bunting into the shaft while engaged taking the pumps out of it.	–	–	1	–	–	1
„ 28	16	Westmuir -	Glasgow - -	Robert Gray and Co. -	Samuel Owens -	Roadsman -	28	Fall of roof at the face (while redding)	–	1	–	–	–	1
„ 29	17	Eastfield -	Rutherglen -	T. G. Buchanan - -	William Rodger -	Collier -	38	Explosion of gunpowder (by going hurriedly in to a shot which had "hung" fire).	–	–	–	1	–	1

SCHEDULE I.—List of Fatal Colliery Accidents—*continued.*

Date.	No. of Accident.	Name of Colliery.	Where situate.	Owners' Names.	Persons killed.	Occupation.	Age.	Cause of Deaths, and Remarks.	Number of Lives Lost.					
									Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1864. July 6	18	Eastfield - -	Rutherglen -	T. G. Buchannn - -	Thomas Conway -	Redsman -	24	Fall of a stone from the side of the shaft.	–	–	1	–	–	1
„ 15	19	Bogleshole, No. 2	Tollcross -	Colin Dunlop and Co. -	Archd. McArthur -	Fireman -	35	Explosion of fire-damp (while examining the workings with an unprotected light.	1	–	–	–	–	1
„ 29	20	Coats, No. 3 -	Coatbridge -	William Baird and Co. -	James Morgan -	Collier -	40	Explosion of fire-damp - - -	1	–	–	–	–	1
Aug. 1	21	Britton pit -	Ditto -	W. D. Dixon - -	Robert Duncan -	Ditto -	34	Ditto - - - - - -	1	–	–	–	–	1
„ „	„	Ditto - -	Ditto -	Ditto - - -	Robertson Craig -	Ditto -	27	Ditto - - - - - -	1	–	–	–	–	1
„ „	„	Ditto - -	Ditto -	Ditto - - -	Francis Hamilton -	Ditto -	31	Ditto - - - - - -	1	–	–	–	–	1
„ 4	22	Hillhead, No. 1 -	Kilmarnock -	John Gilmour and Co. -	John Guthrie -	Bottomer -	64	By getting in contact with the cage when in motion.	–	–	1	–	–	1
„ 30	23	Corseford - -	Johnstone -	Trustees of the late Mr. Houston.	Alexander McNab	Collier -	16	Fall of coal at face - - -	–	1	–	–	–	1
Sept. 12	24	Dalquharran -	Maybole -	T. F. Kennedy - -	John McMurray -	Ditto -	42	Fall of coal, while "robeing" a pillar, contrary to the rules of the colliery.	–	1	–	–	–	1
„ 30	25	Rosehall, No. 5 -	Coatbridge -	Addie and Miller - -	Alexander Underwood.	Pumper -	57	By attempting to get into the cage at the pit-bottom without giving the proper signal.	–	–	1	–	–	1
Oct. 12	26	Hurlford - -	Hurlford -	John Howie - - -	John Carrel - -	Oversman -	27	Fall of coal - - - - - -	–	1	–	–	–	1
„ 17	27	Craigie - -	Ayr - -	Robert Brown - -	James Ferguson -	Collier -	60	Fall of roof at the face - - -	–	1	–	–	–	1
„ 21	28	Ashyard - -	Hurlford -	Eaglesham and Dunlop -	William McTaggart	Ditto -	22	Ditto - - - - - -	–	1	–	–	–	1
„ „	„	Ditto - -	Ditto -	Ditto - - -	John Hamilton -	Ditto -	17	Ditto - - - - - -	–	1	–	–	–	1
„ 22	29	Rosehall, No. 10 -	Coatbridge -	Addie and Miller - -	Michael Gatton -	Brusher -	40	Fall of roof in an old stow road -	–	1	–	–	–	1
Dec. 8	30	Aikenston, No. 2	Baillieston -	James Merry - -	William Pryde -	Collier -	18	Fall of roof, while acting as "chainman" on an engine plane, occasioned by the hutches drawing out wood, which allowed part of the roof to fall.	–	1	–	–	–	1
„ 26	31	Hurlford - -	Hurlford -	John Howie - - -	David McIntyre -	Bottomer -	53	Crushed by the cage when crossing the shaft.	–	–	–	1	–	1
									5	15	11	4	–	35

SCHEDULE No. II.

LIST of the FATAL ACCIDENTS in IRONSTONE MINES, and LOSS OF LIFE arising therefrom, in the WESTERN DISTRICT of SCOTLAND, during the Year ended 31st December 1864.

Date.	No. of Accidents.	Name of Colliery.	Where situate.	Owners' Names.	Persons killed.	Occupation.	Age.	Cause of Deaths, and Remarks.	Number of Lives lost.					
									Explosions.	Falls of Ironstone and Roof.	In Shafts.	Miscellaneous.	Above Ground.	Total.
1864. Jan. 2	1	Braehead, No. 5	Lugar - -	W. Baird and Co. - -	Redman Cannan -	Miner -	36	Fell into the shaft while in a state of intoxication.	–	–	1	–	–	1
„ 4	2	Gartshore, No. 4	Kilsyth - -	Ditto - - - -	Robert Howieson -	Engineman	32	Crushed between the engine seat and a back balance.	–	–	–	–	1	1
„ 23	3	Do. No. 7	Ditto - -	Ditto - - - -	Patrick Gallacher -	Windlassman	25	Fell down the shaft - -	–	–	1	–	–	1
April 20	4	Croy, No. 1 -	Ditto -	Ditto - - - -	James McGilchrist	Miner -	27	Accidental discharge of a shot, while engaged stemming it.	–	–	–	1	–	1
June 17	5	Greenbank -	Dalry - -	Merry and Cunningham -	Patrick Fagans -	Ditto -	48	Fall of roof at face - - -	–	1	–	–	–	1
July 4	6	Knightswood, No. 9.	Maryhill - -	Wilsons and Co. - -	John Scott - -	Ditto -	38	Explosion of fire-damp - - -		–	–	–	–	1
„ 9	7	Common, No. 2	Cumnock - -	W. Baird and Co. - -	John Currants -	Ditto -	40	Fall of roof at face - -	–	1	–	–	–	1
„ 23	8	Kerse, No. 1 -	Patna - -	Wilsons and Co. - -	Ch. McHutcheson -	Ditto -	35	Fall of ironstone - -	–	1	–	–	–	1
Aug. 5	9	Auchinbee, No. 1	Kilsyth - -	W. Baird and Co. - -	William Samson -	Sinker -	45	Fell out of a sinking kettle - -	–	–	1		–	1
„ 15	10	Lockside, No. 1	Kilbirnie - -	Merry and Cunningham -	Barney Dowans -	Trapper -	10	Run over by a "race" of hutches -	–	–	–		–	1
„ 20	11	Tigethaugh, No. 4.	Denny - -	W. Baird and Co. - -	Michael Giffin -	Boy - -	13	Fall of roof at the face - - -	–	1	–		–	
Sept. 24	12	Knightswood, No. 9.	Maryhill - -	Wilsons and Co. - -	Wm. Callichan -	Contractor -	38	Received injuries while blasting by a piece of stone.	–	–	–	1	–	1
Nov. 5	13	Cadder, No. 6 -	Bishopbriggs -	Carron Iron Co. - -	William Leckie -	Miner -	30	Fall of roof at face - -	–	1	–	–	–	1
Dec. 12	14	Faskine, No. 8	Airdrie - -	W. Baird and Co. - -	Robert Baxter -	Labourer -	60	By a boiler bursting - -	–	–	–	–	1	1
									1	5	3	3	2	14

Mr. Morton's Report.

REPORT of the WORKING of the ACT for the REGULATION and INSPECTION of MINES (23 & 24 VICT. c. 151.), in YORKSHIRE, for the Year ended 31st December 1864.—By CHARLES MORTON, Esq.

SIR, Wakefield, March 1865.

I HAVE the honour to submit to you my Annual Report as Inspector of Coal Mines and Ironstone Mines for the Yorkshire district.

The total number of separate fatal accidents in the year 1864 was 53, and the total number of deaths was 57; the lives lost in coal mines being 50, in ironstone mines 2, and in experimental or trial shafts, technically termed "new sinking pits," 5.

The following statement sets forth the number of fatal accidents and the number of deaths resulting therefrom in and about the various pits of this district, during each of the years 1861, 1862, 1863, and 1864:—

	Number of separate fatal accidents.				Number of lives lost thereby.			
	YEAR.				YEAR.			
	1861.	1862.	1863.	1864.	1861.	1862.	1863.	1864.
In collieries - - - - -	52	39	42	47	55	104	48	50
In ironstone mines - - - -	7	7	5	2	7	7	5	2
In new sinking pits - - - -	6	4	1	4	7	4	2	5
Totals - - -	65	50	48	53	69	115	55	57

Hence it appears, that although the mining mortality of the past twelve months slightly exceeds that of the previous twelve months, yet when the deaths which occurred during the last two years are compared with those of the preceding two years, the contrast is favourable and encouraging; the lamentable waste of human life in 1861 and 1862 being 184, whilst in 1863 and 1864 it was fortunately reduced to 112.

It is also satisfactory to observe, in reviewing my experience of more than fourteen years as Government Inspector, that although the catalogue of working collieries in Yorkshire has actually expanded from 260 to 419 (being an increase of 61 per cent.), and the miners employed have gradually multiplied from about 23,500 to about 34,500 (being an increase of 47 per cent.), and the quantity of coal annually got during the same period of time has steadily advanced from about 6¾ millions of tons to upwards of 9¼ millions of tons (being an increase of 38 per cent.), yet the lives lost in coal mines, excluding fatal accidents in ironstone pits and trial shafts, have happily diminished from 106 in the year 1851 to 50 in the year 1864, (being a decrease of 53 per cent.).

It is therefore highly gratifying to find, that since the passing of the first Inspection Act in 1850, the rate of mining mortality in this district has decidedly lessened; whilst the construction of new winnings, the colliery population, and the production of coal have considerably augmented.

Pursuing the comparison it further appears, that for each Yorkshire collier killed in the year 1851, only 63,680 tons of coal were drawn; whilst for each collier killed in the year 1864, as many as 186,000 tons of coal were drawn.

Moreover, during the last mentioned year, only one colliery operative in 690 came to a violent death; but during the year 1851, the mortality amounted to one in 222.

Concerning these figures I ought here to remark, that I omit the fatal casualties in ironstone works and sinking pits, because the original Inspection Act did not apply to them.

Attached to my Report there is a comprehensive and instructive "Return" from all the districts, showing the number of persons employed in the year 1864 at the coal mines and new trial shafts of Great Britain, the number of collieries worked, the number of fatal accidents and lives lost, the quantity of coal raised, and the proportion of deaths (by accident) to the tonnage of coal and the persons employed.

This interesting document proves that Yorkshire contains more coal miners than any other Inspection district in the kingdom, that only one district possesses more collieries, that only three districts produce more coal, and that with regard to personal safety it stands foremost in the list;—the ratio of deaths to the labourers employed being the smallest.

Having already announced that the aggregate number of men and boys killed during the past year in and about the Yorkshire collieries and ironstone mines and sinking pits, was 57, it remains for me to add the subjoined classification of the principal causes of this grievous mortality:—

Causes of Death.	Number of separate fatal Accidents.	Number of Deaths.
Explosion of and suffocation by gases - - - - -	4	6
Explosion of gunpowder - - - - - - -	1	1
Tumbling down shafts - - - - - - -	6	6
Struck by falling substances in shafts - - - - -	4	4
Crushed in or at the bottom of shafts - - - - -	3	3
Roof falling in the mines - - - - - - -	18	18
Coal or other mineral falling in the mines - - - - -	11	11
Run over or crushed by corves in the mines - - - -	2	2
Water bursting into the mines - - - - - -	—	—
Ropes and chains breaking - - - - - -	2	2
Overwinding - - - - - - - -	—	—
Machinery - - - - - - - -	1	1
Steam boilers bursting - - - - - - -	1	3
Incidental causes - - - - - - - -	—	—
Totals in the year 1864 - -	53	57
Do. 1863 - -	48	55
Do. 1862 - -	50	115
Do. 1861 - -	65	69

I am truly thankful to be able to inform you, that for the last twelve months, no very destructive explosion of fire-damp or other stupendous catastrophe has devasted any of the pits in this district.

Out of fifty-three separate misfortunes accompanied by loss of human life, only three involved the death of more than one person; and in the heaviest calamity not more than three persons were killed,

I have appended to my Report the usual Tabular List of fatal mining accidents which happened in this coalfield during the year 1864, and I now beg leave to offer a few details connected with some of these deplorable events.

Early in January, a fall of roof occurred in Messrs. Harpin's Thurstonland Colliery near Holmfirth, whereby Joseph Greaves, the underground-viewer of the pit, was mortally maimed. The unfortunate man had been distinctly told that the roof was giving way, but he wilfully entered the place, and was soon afterwards brought out a corpse.

About the end of January, James White, a banksman at Darfield Main Colliery near Barnsley, suddenly lost his life by an uncommon and remarkable misadventure. A flat iron wire pit-rope, four inches broad, unaccountably snapped near the engine-drum, above-ground; the broken rope, on its rapid descent from the pulleys into the shaft, fatally struck the poor fellow when he was standing at the pit top.

In the first week of March, Philip Hardy, a miner at Messrs. Baines and Co.'s Sharlston Colliery near Wakefield, was blasting stone with gunpowder in a subterranean road; but instead of prudently applying the ordinary fuse, he carelessly preferred a piece of rag wherewith to ignite the cartridge. This clumsy expedient did not succeed, and the "shot" missed fire; the luckless man then hastily and ignorantly began to meddle with it, and almost instantly the "shot" went off, and inflicted upon him serious and deadly wounds.

Towards the end of March, a collier named Benjamin Siddall, was severely and irrecoverably burnt by an explosion of inflammable gas in the Drighlington Coal Co.'s Doles Wood pit near Leeds. He was improperly allowed to work with a naked light only a few yards from a fiery place which had been left "unbratticed" or unventilated. Siddall was duly cautioned not to approach this dangerous spot, but he heedlessly forgot the warning; and by going in, he fell a victim to his own disobedience. Nevertheless, there was such manifest disregard of Rules in this case, by John Greenough the agent and by William Marshall the underground viewer, that I caused each of them to pay a penalty of 5*l.* for their negligence.

In the latter part of May, one person suffered a melancholy death at Messrs. Charlesworth's Higham Colliery near Barnsley, by tumbling down a sinking shaft; whilst four other persons who were at the bottom had a marvellous escape. George Jenkinson, the banksman, inadvertently rolled into the pit from the surface, and dragged with him a tram and an empty tub; but strange to say the four sinkers below remained unhurt.

On the 9th of June, Benjamin Hepworth and John Greenwood were killed, and William Carter was burnt by an explosion of combustible gas in a sinking shaft at Snydale Colliery near Pontefract, belonging to Messrs. Rhodes and Co. The workmen used Stephenson's safety lamps, but the ventilation had been neglected for several days, and fire-damp appeared in the pit bottom. The sinkers having set a "shot" and lit the fuse, they were being drawn up the shaft, when the gas quickly kindled at the blazing fuze before the charge of gunpowder became ignited. In consequence of my representations as to the culpability of those who superintended these works, James Wilson the agent was fined 10*l.*, and Richard Cowling the contractor was fined 5*l.*, to which the proprietors voluntarily added 40*l.* for the relief of the two widows of the deceased,—27*l.* 10*s.* being given to each.

On the 18th of June, a fearful boiler explosion happened at Messrs. Baines and Co.'s Sharlston Colliery near Wakefield, and fatally scalded and mutilated Samuel Clamp and John Noble and William Dickenson, who were employed there. The boiler alluded to was comparatively new, having been made about three years ago by Messrs. Horsfield of Dewsbury; and it had since undergone sundry repairs, not only by them but by Mr. Hepworth, Mr. Arnold, and the colliery blacksmiths. It was the centre boiler of a series of three, all of them being of plain cylindrical egg-ended construction, externally fired, and each set with a flash flue. The length of the boiler was 37 feet, its diameter $6\frac{1}{2}$ feet, and the thickness of its plates from $\frac{3}{8}$ths to $\frac{7}{16}$ths of an inch; while the pressure of steam varied from 35 lbs. to 40 lbs. per square inch. The owners alleged that the iron was bad, and the boiler makers declared that the water *was worse.* The greater portion of the water which fed the exploded boiler was drawn from the pit, and was of a sedimentary character. Moreover, the water was pumped cold into the boiler, the firing seems to have been rather heavy, and the boiler had frequently leaked and had been rudely patched. As the deaths resulting from this disaster occurred in different localities, there were two Coroner's inquests. At the first, held in Sharlston, the jury merely returned a verdict of "accidentally killed;" but at the second inquest, held in Leeds, the jury arrived at the following conclusion: "We find a verdict of accidental death; and we are unanimously of opinion that the Lancashire boiler is safer than the egg-ended boiler, but whether it is better adapted for collieries we cannot determine; that the evidence is in favour of the iron used in the manufacture of the exploded boiler being sufficiently strong for the purpose intended, and that the boiler was made according to contract; that the repairs by Messrs. Horsfield, Hepworth, and Arnold appear to have been done in a workmanlike and substantial manner; that the last repair by the servants of Messrs. Baines and Co. was ineffectually and improperly done, and we condemn the mode in which it was attempted to repair the damage; that the bursting of the boiler is mainly attributable to the inferiority of the water, the sedimentary character of which is highly injurious. Lastly, we recommend Messrs. Baines and Co. to change the water entirely, to prohibit their own servants from attempting any repairs in future, and that if similar circumstances should again arise, instead of employing various indifferent workmen to repair the damage, they ought to be advised by persons of competent skill, not only as to the exact cause of leakage, but the most effectual mode of preventing its recurrence." The proprietors of the mine promised to comply with these suggestions as far as possible; they have since formed an additional large pond for the collection of pure surface water, and have taken other precautionary measures for avoiding a repetition of the evils complained of.

On the last day of June, Charles Williams, who was helping to sink a pit at Waleswood Colliery near Sheffield, was mortally injured by a portion of unprotected shale falling upon him from the side of the shaft. A depth of nearly 12 yards at the bottom of the pit was imprudently left unwalled and unlined. The Coroner's jury found a verdict of "accidental death;" but they expressed an opinion that Joseph Shaw, the agent, had not exercised reasonable care for the safety of the workmen engaged in sinking the shaft.

In July, at the Hepworth Iron Company's Colliery near Holmfirth, a little boy only 12 years old, named Jonathan Beaumont, was illegally sent alone down a pit; the Rule being, that lads under 15 years of age should be accompanied by a man. Whilst descending the shaft, the unfortunate youth was by some inexplicable mischance thrown out of the cage and precipitated to the bottom; and thus he lost his life. The investigation of this casualty showed that Messrs. Craven & Co. the mine owners, and David Sykes the agent, and John Kay the underground viewer, had in various ways disregarded the requirements of the law and of the general Rules and special Rules, for which they jointly paid penalties amounting to 34*l.*; the money being deservedly bestowed on the poor father of the deceased boy.

Early in August, a fall of roof took place in Mr. George Ellison's West Yorkshire Colliery near Leeds, and fatally crushed Matthew Beaumont who was employed there as a coal hewer. He and his comrade had noticed several suspicious looking cracks in the superincumbent strata, and had agreed to secure themselves by setting some props, of which they had an ample stock; but instead of doing so at once, they unwisely delayed the operation until it was too late. This dangerous habit of procrastination is the prolific source of many dreadful accidents in mines.

During the second week of September, an orphan lad named Edward Pinder was killed, and a man was much hurt by the fall of a corf in one of the shafts at Messrs. Wilcock & Co.'s Rock Colliery near Leeds. These unfortunate persons were being drawn up the pit in a cage, and at the same time (contrary to the special Rule) a corf was being lowered in the other cage. By some mishap, the corf slipped out of the descending cage; and tumbling down the shaft, violently struck the poor fellows who were ascending. It was clearly proved at the inquest that the banksman, Robert Fisher, had often violated the Rule which directs that the corves shall be taken out of the cages when persons are passing up or down the pit; and this flagrant disobedience was also well known to and was sanctioned by the agent, Henry Kitson. The Coroner's jury therefore delivered a verdict of "manslaughter" against both offenders; and at the Leeds Assizes, Fisher was found guilty and sentenced to one month's imprisonment with hard labour, whilst Kitson was acquitted; but the presiding Judge intimated to Kitson that he had been in great peril.

Later in September, Levi Ramsden, who was sinking a shaft for the Drighlington Coal Company at Lumb Wood near Leeds, received his death blow from a piece of stone which fell out of the bare side of the pit, when he was in the bottom. The shaft was 48 yards deep; and 36 yards of the upper part had been properly walled, but the other 12 yards below were incautiously left without lining of any kind. The agent, John Greenough, was certainly not justified in allowing so much of this sinking pit to remain unwalled and untimbered.

On the 22d of November, two colliers named George Ward and Benjamin Goodall, were mortally burnt, and two others were greatly injured by an explosion of inflammable gas, in the Fence Coal Company's new mine at Woodhouse Mill near Rotherham. The misfortune occurred in No. 10 "bank" at the south-western extremity of the works; and although about 8,000 cubic feet of air per minute went along the main south levels, only 5,000 or 6,000 cubic feet reached the spot where the fire-damp was ignited by the men's candles. Gas had often been detected in various places during the last eighteen months, and on several occasions there had been what are termed "*slight flashes*," by one of which Samuel Fletcher was burnt. Some fire-damp had been observed in No. 10 "bank" about a week before the fatal explosion; and though none was actually seen on that melancholy morning, yet a strong opinion afterwards prevailed that the deadly gas might have been discovered by the deputy, William Holbrook, if diligent search had been made. This "bank" had recently crossed a small dislocation of strata, and the roof had also broken down in the "goaf," therefore fire-damp was very likely to show itself at any moment; but neither superintendents nor workpeople thought it needful to introduce safety lamps. Thomas Redfern, the underground viewer, said at the Coroner's inquest,—"we never order lamps unless *we see gas*." The jury returned a verdict of "accidentally killed," but they heavily censured William Holbrook, the deputy; and the colliery owners summarily dismissed him from their service, because he did not sufficiently examine No. 10 "bank" on the morning of the fatal explosion. Even after this serious disaster, safety lamps were only partially adopted; but I have since earnestly advised the agent, Mr. Edward Hedley, to strengthen the ventilation considerably, to exclude naked lights entirely, and to use Stephenson's lamps exclusively throughout the mine.

I am sorry to have to acquaint you, that for the year 1864 there is a somewhat larger list of accidents which were *not followed by death*, but which were still attended by a greater or less amount of human suffering.

The subjoined analysis shows the number and origin of these lamentable misfortunes during the last four years:

Causes of Non-fatal Accidents.	Number of separate Non-fatal Accidents.				Number of Persons injured thereby.			
	Year.				Year.			
	1861.	1862.	1863.	1864.	1861.	1862.	1863.	1864.
Explosion of and suffocation by gases - -	18	15	21	12	42	31	27	22
Explosion of gunpowder - - -	5	2	5	—	6	2	7	—
Tumbling down shafts - - - -	3	4	2	2	4	4	2	2
Struck by falling substances in shafts - -	1	3	3	1	1	3	3	3
Crushed in or at the bottom of shafts - -	—	3	1	5	—	3	1	5
Roof falling in the mines - - -	20	28	15	28	20	30	15	30
Coal or other mineral falling in the mines -	16	20	27	22	16	20	28	23
Run over or crushed by corves in the mines -	10	11	10	15	10	11	10	15
Water bursting into the mines - - -	—	—	—	—	—	—	—	—
Ropes and chains breaking - - -	1	—	—	—	2	—	—	—
Overwinding - - - - -	1	—	—	1	3	—	—	1
Machinery - - - - - -	3	1	2	2	3	1	2	2
Steam boilers bursting - - - -	1	—	—	1	1	—	—	2
Incidental causes - - - -	7	7	4	6	7	7	4	7
Totals - -	86	94	90	95	115	112	99	112

It is really distressing to observe from the foregoing statement, that so many as 112 men and boys were previously (*though not mortally*) maimed by 95 separate accidents happening in a single year at the Yorkshire collieries and ironstone mines and sinking pits: it thus appears that the non-fatal injuries were about twice as numerous as the fatal ones.

Many of these sad occurrences were certainly attributable to the thoughtlessness or wilfulness of the unhappy sufferers themselves; whilst others were undoubtedly owing to the incompetence or negligence of officers having control over the works; and nearly all of them were clearly traceable to ignorance of or inattention to Rules and orders.

I will briefly cite a few remarkable examples:

At Haigh Colliery near Barnsley, the underground viewer, Robert Leather, and a miner incautiously went with a naked light into a fiery place, and both were burnt. For this misconduct Leather was immediately afterwards deprived of his situation.

At Gawthorp Colliery near Wakefield, a hewer named John Wilkinson carelessly left a heap of rubbish lying, which caused inflammable gas to accumulate, and thereby another person got burnt: the offender was fined twenty shillings.

At Emroyd Colliery near Wakefield, William Peace, a deputy, obstinately laid aside his safety lamp, lit a candle, and entered an unventilated spot where fire-damp ignited and scorched him.

At Tong Colliery near Bradford, a deputy named Isaac Sugden and three miners were burnt in consequence of the deputy unwarrantably admitting a naked light into works which he knew to be dangerous. Sugden therefore paid a penalty of 3*l.* to the other unfortunate persons.

At Dewsbury Moor Colliery near Dewsbury, a young boy was much injured by explosive gas; and Moses Crossley, the underground-viewer, was fined 3*l.* because he wrongfully omitted to examine the place at the appointed time. The money was paid to the poor lad's parents.

At Whitwood Colliery near Normanton, John Sissons the underground-viewer, and Joseph Pyrah a deputy, foolishly burnt themselves by having a lighted candle in close proximity to safety lamps when fire-damp was present.

At Stanley Colliery near Wakefield, two miners were scorched by disobediently taking a naked light near to the face of a drift where combustible gas was lurking.

At the Holmes Colliery near Rotherham, a man named Samuel Pearce was sent to jail for a month with hard labour, for unlawfully smoking tobacco where safety lamps were being used.

At Allerton Main Colliery near Leeds, a furnace keeper was also committed to prison for six weeks with hard labour, for neglecting the ventilating furnace, whereby the air in the pit was slackened to an alarming extent.

At Newton Colliery near Pontefract, a hewer named Thomas Butler was fearfully crushed by a fall of coal, because he would not apply the "sprags" which were intended to support it.

At Waterloo Main Colliery near Leeds, Jesse Woodhead, a miner, was sadly bruised by a fall of roof, having forgot to fix props which he was positively told to make use of.

At Britannia Main Colliery near Leeds, an inexperienced youth was imprudently allowed by Jonah Jowett, the underground-viewer, to work in an insecure place; the result being that the lad's thigh was broken by a fall of coal. To avoid litigation, the sum of 6*l*. was paid by the proprietors for compensation and surgical assistance.

At Worsborough Park Colliery near Barnsley, a careless engineer named Henry Parkin, violently drew Thomas Corbridge up to the pit-pulleys, and the poor fellow was thus severely wounded. Parkin was forthwith discharged from his employment.

At Beeston Colliery near Leeds, John Webster, a banksman, injudiciously permitted the young gin-driver to ride in a corf on the pit-hill, (Webster playfully pushing it along). Very soon, the corf and boy and man tumbled all together down the shaft, and it is quite amazing how they survived the dreadful shock.

At Altofts Colliery near Normanton, an engineman named David Lindley illegally requested an unpractised individual to tend the drawing engine, who heedlessly raised the cage with great force to the pit-pulleys, at the imminent risk of death to the workpeople. Lindley was therefore prosecuted, and fined twenty shillings.

During the year 1864, nearly 50 per cent. of the lives lost and serious personal injuries inflicted by mining operations in this district, proceeded from falls of roof or coal or ironstone; a large proportion of which might have been avoided by a more watchful and methodical system of "propping" and "spragging."

Although fatal explosions of firedamp were rather more frequent in the year 1864 than they were in the year preceding, yet I am glad to inform you that the *non-fatal* explosions were less frequent. Indeed, the number of persons burnt (*but not killed*) has gradually been decreasing for the last four years; the figures being respectively 42, 31, 27, and 22.

In every case of explosion during the past twelve months, the inflammable gas was kindled by a naked light; and I am fully convinced that misfortunes of this kind may be still further diminished, if not absolutely averted, by the universal adoption of *safety lamps*, united with good ventilation, in fiery mines; for in such pits, the workmen cannot be thoroughly protected from explosion if the use of *naked lights* is continued.

Complaints by colliery operatives and others have as heretofore reached me from various parts of the West Riding; and on being inquired into, I have occasionally found them to be somewhat exaggerated, but chiefly (though not uniformly) they were true and reasonable.

In a great majority of these investigations, the owners and agents of mining establishments thus complained of, have willingly and promptly carried into effect such alterations and amendments and regulations as seemed to me practicable or desirable or necessary, for remedying real defects and preventing dangerous accidents.

At the same time it is my duty to add, that in several of these and similar cases, it was very evident that little or no substantial redress or improvement could be obtained through the existing legal powers of the Government Inspector, or under the partial and imperfect "arbitration clauses" of the present Mining Acts.

I regret to say that the educational provisions of the Statute 23 and 24 Vict. c. 151 are more appreciated and better observed by the masters in this district than they are by the men.

It is further apparent that a correct opinion is beginning to be entertained on both sides, that after a certain date to be determined by the Legislature, boys under 12 years of age, and boys unable to read and write, should not be eligible to work in a mine: of course preserving the industrial rights of those already employed.

Finally; this Report is accompanied by "Summaries" of the separate fatal accidents and lives lost in and about the collieries and inspected ironstone mines of Great Britain during the year 1864.

I have, &c.
CHARLES MORTON,
Inspector of Mines.

To the Right Hon. Sir George Grey, Bart., M.P.,
Her Majesty's Principal Secretary of State for
the Home Department, Whitehall, London.

TABULAR LIST of FATAL MINING ACCIDENTS in YORKSHIRE, referred to by Mr. MORTON, in his Report for the Year ended 31st December 1864.

Number of Fatal Accidents.	Dates of Accidents.	Number of Lives lost.	Names of the Persons killed.	Names of the Mines where Accidents occurred.	Where situate.	Names of the Owners.	Whether Coal Mine, Ironstone Mine, or Sinking Pit.	Causes of Death.
	1864.							
1	January 1	1	George Bankhouse	Garforth	Leeds	F. C. T. Gascoigne, Esq.	C.	Fall of coal in the mine.
2	,, 4	1	Thomas Froggatt	Thrybergh Hall	Rotherham	Thrybergh Hall Coal Co.	C.	Crushed by a corf in the mine.
3	,, 6	1	John Rook	High Royd	Barnsley	Hall and Co.	C.	Fall of coal in the mine.
4	,, 8	1	Joseph Greaves	Thurstonland	Holmfirth	Messrs. Harpin	C.	Fall of roof in the mine.
5	,, 11	1	Benjamin Smith	Cottage of Content	Rotherham	Mr. George Law	C.	Breaking of a round hempen pit-rope.
6	,, 19	1	Frederic Smith	Whitwood	Normanton	Briggs and Co.	C.	Fall of coal in the mine.
7	,, 25	1	Benjamin Thompson	Hunsworth	Bradford	Bowling Iron Co.	C.	Crushed by the cage at the bottom of the shaft.
8	,, 28	1	James White	Darfield Main	Barnsley	Darfield Main Coal Co.	C.	Breaking of a flat iron wire pit-rope.
9	February 11	1	Joseph Bottomley (a boy)	Hunsworth	Bradford	Bowling Iron Co.	I.	Fall of roof in the mine.
10	March 3	1	Abraham Copley	Wharncliffe Silkstone	Sheffield	Wharncliffe Silkstone Coal Co.	C.	Ditto.
11	,, ,,	1	James Howson	Lundhill	Barnsley	Lundhill Coal Co.	C.	Ditto.
12	,, 8	1	William Mettric	Mount Osborne	Ditto	William Day, Esq.	C.	Fall of coal in the shaft.
13	,, 15	1	George Harrison	Darley Main	Ditto	Messrs. Croft	C.	Fall of coal in the mine.
14	,, 19	1	Philip Hardy	Sharlston	Wakefield	Baines and Co.	C.	Explosion of gunpowder in the mine.
15	April 9	1	William Renton (a boy)	Gildersome	Leeds	Messrs. Holliday	C.	Run over by corves in the mine.
16	,, 17	1	David Shaw	Cleckheaton	Bradford	Low Moor Iron Co.	I.	Fall of roof in the mine.
17	,, 21	1	Thomas Keithley	Woolley	Barnsley	Woolley Coal Co.	C.	Fall of coal in the mine.
18	,, 24	1	Benjamin Siddall	Doleswood	Leeds	Drighlington Coal Co.	C.	Explosion of fire-damp.
19	,, 27	1	John Wilson	Ellerby Lane	Ditto	Bowling Iron Co.	C.	Crushed by a steam-engine.
20	,, 28	1	Edward Newton	New Hall	Ditto	Grosvenor and Co.	C.	Fall of roof in the mine.
21	May 19	1	William Preston (a boy)	Shipley Moor	Bingley	Briggs and Sons	C.	Falling down the shaft.
22	,, 26	1	James Haley	Ridings	Dewsbury	Crawshaw and Co.	C.	Fall of roof in the mine.
23	,, 28	1	George Jenkinson	Higham	Barnsley	Messrs. Charlesworth.	S.	Falling down the shaft.
24	June 9	2	Benjamin Hepworth and John Greenwood.	Snydale	Pontefract	Rhodes and Co.	S.	Explosion of fire-damp.
25	,, 13	1	George Bradshaw (a boy)	Hostingley	Dewsbury	Joshua Ingham, Esq.	C.	Fall of roof in the mine.
26	,, 18	3	Samuel Clamp, John Noble, and William Dickenson (a boy).	Sharlston	Wakefield	Baines and Co.	C.	Bursting of a steam engine boiler, above-ground.
27	,, 21	1	Frank Haigh	Holmes	Rotherham	Holmes Coal Co.	C.	Fall of coal in the mine.
28	,, 22	1	John Hayes (a boy)	Victoria	Leeds	Messrs. Haigh	C.	Explosion of fire-damp.
29	,, 30	1	Charles Williams	Waleswood	Sheffield	Holford and Co.	S.	Fall of stone in the shaft.
30	July 3	1	Robert Jackson (a boy)	Fence	Rotherham	Fence Coal Co.	C.	Falling down the shaft.
31	,, 13	1	Joshua Parkin	Park Gate	Ditto	Earl Fitzwilliam	C.	Fall of roof in the mine.
32	,, 19	1	Jonathan Beaumont (a boy)	Hepworth	Holmfirth	Hepworth Iron Co.	C.	Falling down the shaft.
33	,, 22	1	Thomas Roberts (a boy)	Haigh Moor	Normanton	Pope and Co.	C.	Fall of roof in the mine.
34	,, 26	1	Jonathan Mitchell	Park Gate	Rotherham	Earl Fitzwilliam	C.	Fall of coal in the mine.
35	August 3	1	Matthew Beaumont	West Yorkshire	Leeds	George Ellison, Esq.	C.	Fall of roof in the mine.

Tabular List of Fatal Mining Accidents in Yorkshire—*continued.*

Number of Fatal Accidents.	Dates of Accidents.	Number of Lives lost.	Names of the Persons killed.	Names of the Mines where Accidents occurred.	Where situate.	Names of the Owners.	Whether Coal Mine, Ironstone Mine, or Sinking Pit.	Causes of Death.
	1864.							
36	August 3	1	Christopher James	Milnthorp	Wakefield	Messrs. Charlesworth	C.	Fall of roof in the mine.
37	„ 6	1	John Calvert (a boy)	Baildon Moor	Leeds	Mr. William Midgley	C.	Falling down the shaft.
38	„ 31	1	William Norbury	Silkstone Fall	Barnsley	Booth and Co.	C.	Crushed by the cage at the bottom of the shaft.
39	September 3	1	Thomas Simpson (a boy)	Garforth	Leeds	F. C. T. Gascoigne, Esq.	C.	Fall of coal in the mine.
40	„ 9	1	Edward Pinder (a boy)	Rock	Ditto	Wilcock and Co.	C.	Fall of a corf in the shaft.
41	„ 12	1	Abraham Goldthorp	Darfield Main	Barnsley	Darfield Main Coal Co.	C.	Fall of coal in the mine.
42	„ 20	1	James Wootton (a boy)	Wharncliffe Silkstone	Sheffield	Wharncliffe Silkstone Coal Co.	C.	Crushed by the cage at the bottom of the shaft.
43	„ 22	1	Levi Ramsden	Lumb Wood	Leeds	Drighlington Coal Co.	S.	Fall of stone in the shaft.
44	„ 30	1	Charles Nuttall	Blacker Main	Barnsley	Blacker Main Coal Co.	C.	Fall of roof in the mine.
45	October 4	1	John Hirst	Nostell	Wakefield	Charles Winn, Esq.	C.	Ditto.
46	„ 23	1	Joseph Brailsford	Park Gate	Rotherham	Earl Fitzwilliam	C.	Ditto.
47	November 7	1	John Mellor	Ditto	Ditto	Ditto	C.	Ditto.
48	„ 11	1	William Herring	Fence	Ditto	Fence Coal Co.	C.	Ditto.
49	„ 17	1	Joseph Telford	Spring Gardens	Leeds	Drighlington Coal Co.	C.	Ditto.
50	„ 22	2	George Ward and Benjamin Goodall.	Fence	Rotherham	Fence Coal Co.	C.	Explosion of fire-damp.
51	„ 26	1	William Lumb	Darfield Main	Barnsley	Darfield Main Coal Co.	C.	Fall of coal in the mine.
52	„ 30	1	Thomas Thompson	Balaklava	Leeds	West Ardsley Coal Co.	C.	Falling down the shaft.
53	December 28	1	Christopher McCann	Mount Osborne	Barnsley	William Day, Esq.	C.	Fall of coal in the mine.
	Total	57						

Number of lives lost in Coal Mines	(marked C. in the above list)	50
Ditto in Ironstone Mines	(marked I. ditto)	2
Ditto in experimental or trial shafts, technically termed "New Sinking Pits"	(marked S. ditto)	5
	Total	57

CHARLES MORTON,
Inspector of Mines.

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